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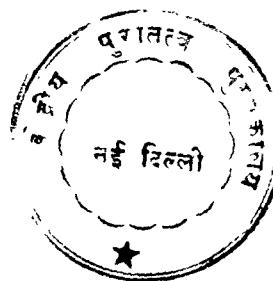
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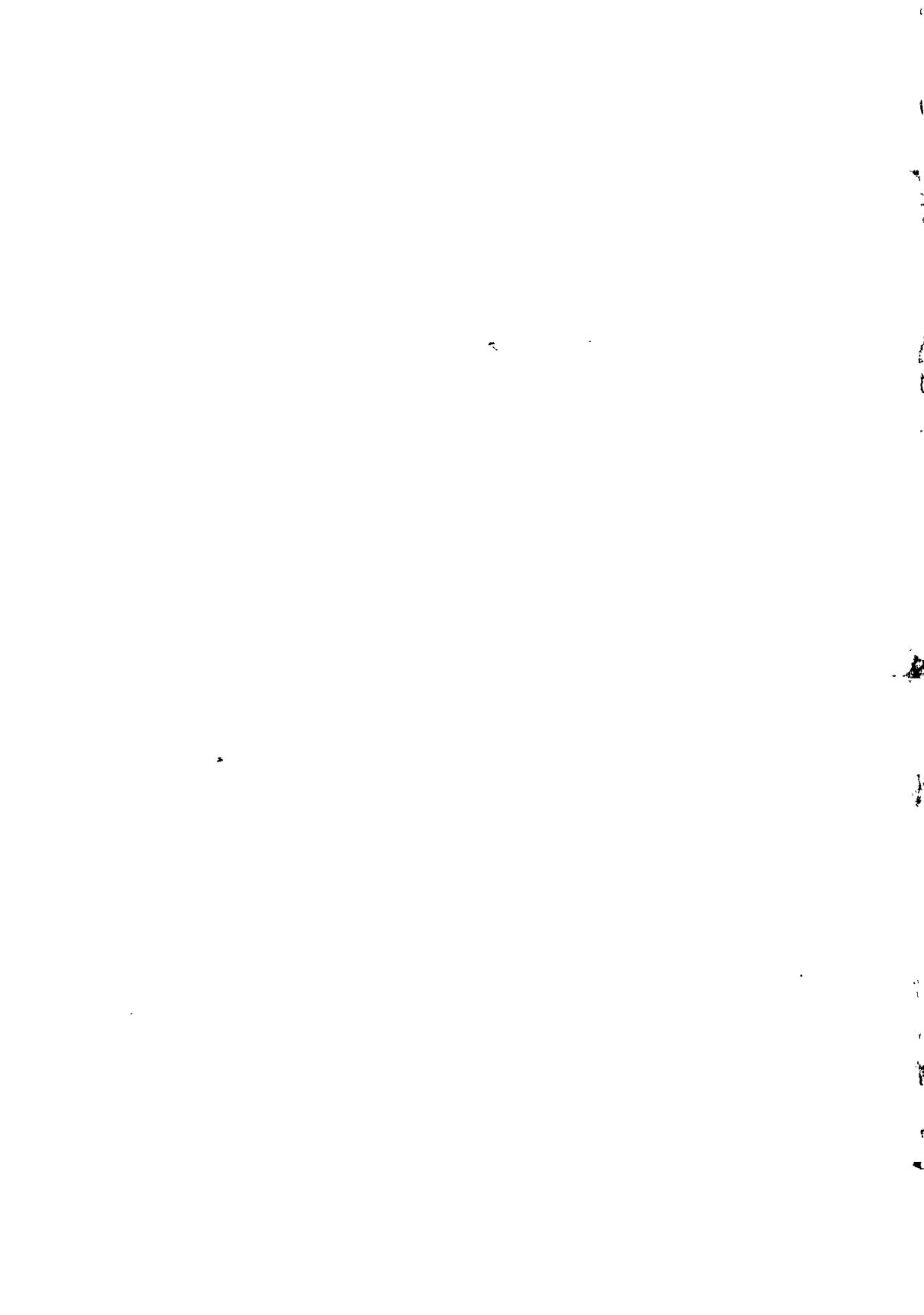
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**ESSAYS IN
INDIAN PROTOHISTORY**



ESSAYS IN INDIAN PROTOHISTORY

EDITORS

D. P. AGRAWAL
DILIP K. CHAKRABARTI



[PUBLISHED ON BEHALF OF THE INDIAN SOCIETY FOR
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FOR H. D. SANKALI

द्रव्याधित दृश्या दिनांक...
निर्देश लख्या.....
..... नहु दिल्ली
केन्द्रीय पुरातत्व पुस्तकालय

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Introduction

THE ESSAYS in the present volume deal with Indian prehistory from the beginning of food-production to the use of iron. They do not deal with all the major issues and problems involved, but they may be said to significantly represent the research interests and current thoughts related to this period. No other volume of this kind has been published in Indian archaeology since *Indian Prehistory : 1964* (edited by V.N. Misra and M.S. Mate) which was published by the Deccan College, Poona, in 1965. Limited only to the later part of Indian prehistory and published more than a decade later, this volume is obviously more detailed in scope and more representative of the state of research in late Indian prehistory or protohistory.

I

The papers in the volume are, of course, conditioned by the general level of archaeological research in India. The limitations of this research and the historical factors behind the present state of Indian archaeology will be separately discussed at the end of this volume. Here we may focus on the trends which have become clear in recent years.

The first of these trends is in the area of natural-scientific analyses. The establishment of a radiocarbon laboratory in the Tata Institute of Fundamental Research, Bombay (this laboratory has now been shifted to the Physical Research Laboratory, Ahmedabad), was a major step in this direction. One would say that there has been a quiet revolution in Indian prehistoric and protohistoric chronology because of the work of this laboratory. Plans are afoot to initiate other dating methods as well. Secondly, a number of workers have now concentrated on the problems of early Indian metallurgy and whatever data are available have provided fresh insights into the general issue. Thirdly, there is an increasing concern with the ecological background of early cultures. This is an area where multi-disciplinary research is yielding positive results, notably in Maharashtra, Gujarat and Rajasthan. Fourthly, the analysis of ancient plant remains and the study of ancient animal remains have made significant progress. These are perhaps the major aspects of natural-scientific analyses in Indian archaeology but there are other developing aspects too, and one may not be far wrong in claiming that natural-scientific studies in Indian archaeology have already developed beyond the first, tentative stage.

The second major development lies in the field of basic archaeological research itself. First, there have been many significant discoveries in recent years, and whatever may be said about the quality of analyses and the level of interpretation of these discoveries, the number of discoveries should be considered having a significance of its own. Secondly, the number of good monographs, either on a specific region or on a general theme, is gradually increasing, and it is not uncommon to find attempts at systematisation on various levels. The third major development is in the area of historical interpretations. The diffusionary assumptions are increasingly being challenged and alternative explanations are being put forward in their place. There is also a

gradual dissatisfaction with the other aspects of interpretation in Indian archaeology, and there has been a better realization of the value of anthropological approach to Indian archaeological studies.

One should be honest enough to admit that none of these new developments is yet on an extensive scale or has reached a level of sophistication it should reach, but the very fact that these new trends exist is encouraging.

II

A. Ghosh sums with his usual clarity the different terminological issues of Indian prehistory. While we fully accept his criticism of the use of the term "protohistory" in the Indian context, we feel that the term has been used so long to generally denote Indian prehistory between the beginning of food-production and the use of iron that its discontinuance may not be very reasonable. In the European context the term denotes a stage which may not have any writing itself but is mentioned in the written records of a literate contemporary group. Herodotus' Scythians provide a convenient example. If one admits that the Vedic records refer to the chalcolithic and other contemporary assemblages of India and that a reference to the Vedic records is necessary to explain these archaeological data the term "protohistory" may logically be applied to them. If the term "Meluhha" in the Mesopotamian early literature specifically denotes the area of the Indus civilization and if the use of this term in different early contexts is useful for an understanding of the Indus civilization there is no particular reason why this civilization (with its undeciphered records) cannot be called 'protohistoric'. If one depends only on the archaeological appearance of writing as the criterion of the beginning of the early historic civilization of the Gangetic valley, history does not begin in this area till the Mauryan epigraphs of the third century B.C. However, there is no doubt about the historicity of the birth of Gautama Buddha or of the inclusion of the ancient Gandhara territory in the Achaemenid empire in the sixth century B.C., and in any history of India the period between the sixth and third centuries B.C. has to be based on unwritten historical evidence earlier than the third century B.C. The term 'protohistory' can with all justification be applied to the archaeological levels between the sixth and third centuries B.C. in the Gangetic valley and the northwest. At the same time it should be confessed that the use of this term in these contexts would be not merely pedantic but also historically quite meaningless. One suspects that the problem of terminology has been unduly magnified in Indian prehistoric studies. It is true that the use of European terms outside Europe is not a happy one but these terms because of their long usage have come to denote some general cultural realities and as long as it is remembered that they do not possess the validity of geological terms and that the local situations may differ significantly, there is no reason why these terms cannot continue to be used (without, of course, their further regional subdivisions).

S.P. Gupta discusses the significance of recent discoveries at Aq Kupruk in north Afghanistan and Mehrgarh in Baluchistan. There is little doubt that his basic assumption is correct : if the trend of recent discoveries is any indication, Baluchistan and north Afghanistan may very well lie in the nuclear zone of wheat-barley cultivation. Two recent dates from Rana Ghundai support Gupta's assumption (P. 2148—4470±60 B.C.—belonging to either RG I or to occupation immediately preceding RG II ; P—21493—3380±60

B.C.—RG IIIA. (*Radiocarbon*, vol. 19, no. 2, 1977, p. 215) J.G. Shaffer's systematic and useful summary of the recent researches on the problems associated with the Indus civilization raises, among others, two theoretical points : his emphasis on the nomads as a significant factor in the Indus valley economy, and his repudiation of what he calls a strict layer-cake approach to archaeological stratigraphy. Seasonal nomadism happens to be an integral part of the economic system of the Indus valley and its adjacent areas, and unless there has been a significant change in the regional climate since the period of the Indus civilization one may postulate a broadly similar situation for this earlier period also. Shaffer is right in pointing out that this element has been neglected so long in the sub-continental archaeology and that current assumptions about early cultural situations are rooted in such neglect. But the point is that an area as big as the Indus valley and its adjacent areas is likely to contain different ecological niches with perhaps significant differences in cultural adaptations. Ideally the problem is to find out about these different ecological niches along with their different cultural adaptations and to know how they interacted and were integrated within the Indus economic system as a whole (to take a convenient instance, N.G. Majumdar interpreted some sites in and around Lake Manchar as fishing settlements). The issue is not, in fact, only of pastoral nomadism but of different types of economic behaviour in different ecological niches with their interaction with, and integration in, a wider economic system. Secondly, Shaffer's impatience with a strict layer-cake approach to stratigraphy seems to contain, at least in the context of Allahdino, a considerable element of truth. Obviously in this single cultural site the layers are of short time duration, and it is possible that the succession of these layers does not always represent changes in the over-all cultural style. The situation would be greatly different in a multi-cultural site.

Shashi Asthana's paper on the Indus-Mesopotamia trade is a well-written one, but it should be useful to remember that the identification of Meluhha with the Indus valley alone is by no means universally accepted (cf. the cautionary remarks of I.J. Gelb in *Revue d'Assyriologie*, vol. 64, 1970 ; Dilip K Chakrabarti in *Jour. Econ. & Soc. Hist. Orient.*, vol. 18, 1975, pp. 75-78 and "Nippur Indus seal and Indus chronology" in *Man and Environment*, vol. 2, 1978, where the opinion of J.V. Kinnier-Wilson has been cited) and that the Indian origin of certain goods in Mesopotamia, taken for granted by Asthana, would need more careful research before they can be thus accepted.

Suman Pandya offers a brief summary of the explorations and excavations of Harappan settlements in Gujarat. J.P. Joshi discusses the settlement at Surkotada. The report on Kalibangan excavations is still unpublished but B. B. Lal's paper on Kalibangan and the Indus civilization is one of the most detailed publications so far and bears ample evidence of his characteristic clarity of approach and thinking. One would like to draw special attention to his discussion on the relationship between the pre-Harappans and Harappans at the site. J.M. Casal's paper on Amri postulates, among other things, Early Dynastic II correlation of the Indus civilization, and a Kulli origin of the Jhukar culture. The implications of these postulates deserve careful study. Y.M. Chitalwala's paper on the Harappan and post-Harappan settlement pattern in Rajkot district is admittedly based on limited fieldwork but one can have nothing but praise for his approach and clarity of thinking. K.N. Dikshit gives his idea of the problem of late Harappan cultures in a systematic and precise discussion. J.S. Nigam writes on the main types of Indus pottery and this paper may serve as a useful introduction to Indus ceramic studies. Asko

Parpola's analysis of the problem of the Indus script is an illustration of his approach to the problem, although his assertion that "the Dravidian solution is undoubtedly the most likely one suggested by historical linguistics" is by no means as well-founded as he tends to believe. The idea of the Dravidian linguistic affiliation of the Harappan civilization is to some extent based on attempted correlations between the so-called Dravidian culture and some elements of the Indus civilization. As far as archaeology is concerned, all such correlations are mere suppositions. S.C. Malik's interpretation of the social framework of the Harappan civilization in the context of the changing perspectives of archaeology is primarily a theoretical exercise and makes stimulating reading. But the point is that the theories themselves will not lead to any break-through in Harappan or any other archaeological study unless they are integrated within planned field-programmes. However, we do agree with Malik in his idea that the lack of an explicit conceptual framework is one of the most severe limitations of Indian archaeology. Dilip K. Chakrabarti interprets the available (till 1974) data on the size of Harappa settlements.

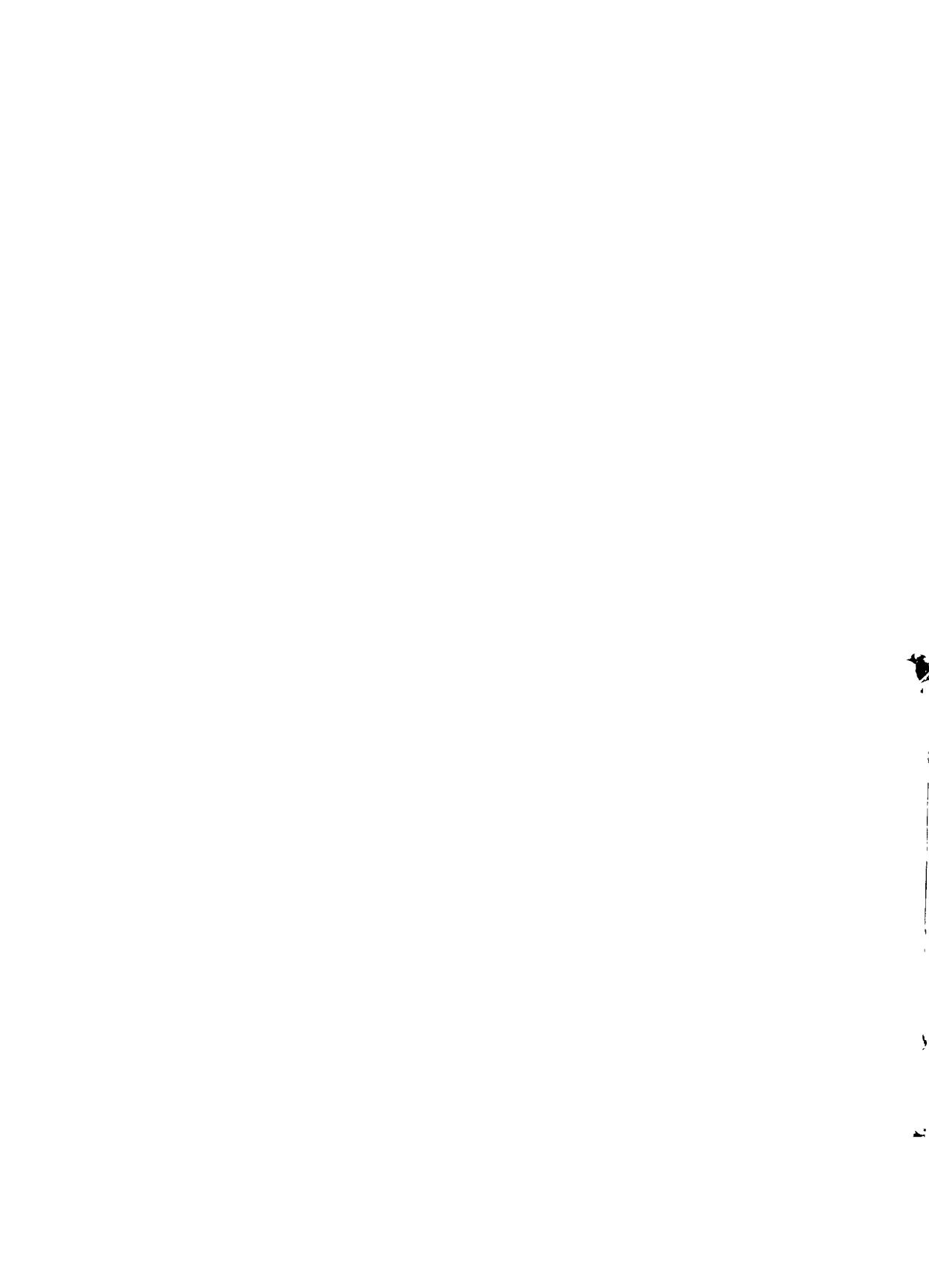
R.N. Kaw's essay on the neolithic culture of Kashmir is a straightforward summary of the published data from Burzahom, and M.K. Dhavalikar's articles on the farming cultures of central India and the Deccan belong to the same genre of writing. Dhavalikar's ideas of the authorship and west Asiatic contacts of these cultures are good examples of diffusionist thinking in Indian archaeology and may not be acceptable to all. H.N. Singh's reasonably detailed analysis of different contexts of the black-and-red ware shows the pitfalls of interpreting this ceramic style in terms of any specific cultural association for movement. K.N. Dikshit discusses the current data on the Ochre Coloured Pottery of the *Doab*, a topic on which he has had a long field-experience. Lala Aditya Narayan's resume of the basic neolithic evidence from eastern India brings out the general complexity of the situation and the need for further well-planned field-work. It is almost unthinkable that the development of a village culture as developed as that of Neolithic Chirand in the alluvium of the Gandak-Ganges confluence was without an antecedent stage somewhere in the eastern region. A careful search should now be made for this antecedent stage.

Purushottam Singh lists the major elements of the early Iron Age in the *Doab*. S. Nagaraju and B.K. Gururaja Rao give their ideas of the chronology of south Indian megaliths while A. Sundara discusses their typology. G. Stacul concentrates on the Iron Age material from Swat and Dilip K Chakrabarti focusses on the northwestern part of the subcontinent as a whole. Both of them reach conclusions which go against some generally current notions about the beginning of iron in this part of the subcontinent. M.D.N. Sahi discusses the issue of iron in the context of Ahar, and his analysis finds theoretical support in Chakrabarti's analysis of the beginning of Indian iron published elsewhere (cf *Antiquity*, June, 1976.)

It has been emphasized earlier that the essays in the present volume should be judged in the context of the general nature of archaeological research in India. But whatever may be said about their quality, there is no point in denying that the study of Indian protichistory has considerably broadened its range of interest in recent years. The present volume has only tried to convey an impression of this widening of interest.

ONE

TERMINOLOGY



Aspects of Periodization and Terminology

1

A. GHOSH

'PREHISTORY', as the word itself would indicate, is that part of the life of humanity which preceded history. And as historians rely chiefly on written records as their source-material, it is customary to regard the knowledge of writing in a society as the dividing-line between history and prehistory. Thus, according to Childe, 'prehistory deals with the period before the earliest written documents begin in Egypt and Babylonia' (*Childe, 1965, p. 4*). This seems to be the tenor of the periodization of cultures by Albright (*Albright, 1946, pp. 82-83*). At the same time, writing has also been regarded by most as a criterion of civilization, *i.e.* the stage when cities, together with all the developments in social economy that they entailed, came into existence. Childe says that a city must not only possess a certain size but also accommodate 'writing' or literacy (*Childe, 1944, p. 8*.) In the same way, Sjoberg holds that 'pre-industrial civilized society' and 'literate pre-industrial society' are synonymous (*Sjoberg, 1960, pp. 10, 32, 33*). Taken together, these would mean that all civilizations would belong to the historical period, that there can be no prehistoric civilization.

But for the Indian sub-continent this emphasis on writing as the harbinger of history is hard to accept. Here the first civilization, the Indus civilization, had its own writing. But as the writing has not yet been deciphered (*pace* all recent claims to satisfactory decipherment), the written records are of no use to the historian. It is true that our ignorance should not stand in the way of giving a historical status to that civilization, but the fact remains that the historian cannot, at least for the present, take charge of the civilization from the archaeologist. And another fact also remains that the literate Indus civilization was followed by several non-literate cultures, which, by the criterion of literacy, would remain prehistoric. A further complicating factor is that the Vedic people, though in all probability ignorant of writing, had a vast mass of sacred literature which was transmitted down orally from generation to generation till it was committed to writing much later on, thus defeating, as it were, the purpose of writing.

The above will show that it is difficult to define what are prehistory and history in India, but as a working-arrangement it may be convenient to regard the historical period of India as having started in about 600 B.C., when the north-Indian scene was dominated by kings and religious teachers whose historicity is not in doubt and before which history

is nebulous. In this book this rough date of 600 B.C. has been taken to mark the end of the prehistoric period in India.

During the last thirty years or so, it has been the custom to introduce a period called 'protohistoric' as a buffer between the ill-defined historic and the better-defined historical periods. Protohistory has been defined as 'the period of human history between prehistory, when no written sources existed, and history *sensu stricto*, when written records are the main source; the time when history can be written only from an appraisal of many sources—archaeological, literary, linguistic and oral' (Daniel, 1950, p. 8). The definition applies, *mutatis mutandis*, to the Vedic period (cf. Allchin, 1968, p. 27, who, while calling all the cultures that precede the historical period 'prehistoric', accept the relevance of the term 'protohistoric', to the culture represented by the Vedic literature). But by that token it would be a mistake to apply the term to the other Indian cultures contemporary or later than the Vedic period, just as by no standard can the whole of India be regarded as having become 'historical' by the sixth century B.C. The remoter areas had to wait for varying lengths of time to become entitled to that status.

But in Indian archaeological literature protohistory has come to comprehend all the Indian cultures from the pre-Harappan days down to the advent of the historical period. While Subbarao would 'for the present' put the Indus civilization in the protohistoric category (Subbarao, 1958, p. 38), Sankalia would include in this category the motley of cultures that followed the Holocene Mesolithic; while admitting that this is not a precise definition, he has adopted the minimum definition of prehistory as comprising the various Stone Ages, but not including the Neolithic, which he classes as protohistoric (Sankalia, 1974, pp. 7-8, 15).

The matter was briefly discussed in the Radio-carbon and Indian Archaeology Symposium in Bombay in 1972 (*Agrawal and Ghosh, Eds., 1973*). In view of the varying and confusing connotation of the term 'protohistory', the present writer expressed himself in favour of discontinuing its use in Indian archaeology, suggesting the retention of only two terms, 'prehistory' and 'history' (A. Ghosh, 1973, pp. 510-11). This was supported by some of the participants in the symposium but opposed by some others, including Sankalia, who said that in India we had a tradition which went back to 1500 B.C. and that the protohistoric period should, by and large, be applied to the post-Mesolithic and pre-Mauryan cultures, between 3500 or 3000 and 300 B.C. (Sankalia, 1973, pp. 509-10).

The matter at present rests at this uncertain and unsatisfactory stage. Equally uncertain is the terminology of the Stone Age. When Stone Age investigations began in India, scholars naturally drew upon the well-established terminology of the European Stone Age—Lower, Middle and Upper Palaeolithic, Mesolithic and Neolithic. There being no clear-cut Upper Palaeolithic in the Indian industrial series, in the fifties some archaeologists replaced the Lower and Middle Palaeolithic and Mesolithic respectively by a trinomial series—Series I, II and III. Subbarao proposed the terms 'Early Stone Age', 'Middle Stone Age' and 'Late Stone Age', so as to divest the Indian palaeolithic and microlithic industries of any European affiliation (Subbarao, 1958, pp. 38-40). In a paper read at the (First) International Conference on Asian Archaeology in 1961, Malik emphasized that the European Stone Age sequence was essentially a provincial phenomenon with no universal applicability and, following Braidwood (*Braidwood, 1960*), proposed the following terms based on subsistence-patterns: I, Food-

gathering Stage, with two suberas, Food-gathering and Food-collecting ; and II, Food-producing Stage (*Malik, 1961 and 1964, pp. 204-05*). As a result of the discussion on this paper, it was felt that there was need for the standardization of Indian Stone Age terminology, and the Conference set up a committee to go into the question.* The committee recommended, Professor Braidwood dissenting, the term 'Stone Age' in place of 'Palaeolithic', dividing it into Early, Middle and Late, the term 'Neolithic' remaining unaltered. For about ten years thereafter these terms more or less held the field and are largely current even now : they have been and are being followed in the publications of the Archaeological Survey of India, and in 1962 Sankalia remarked : 'this direction (of the committee) should be observed to avoid confusion in our discussion' (*Sankalia, 1962, p. xv*).

In the 1972-Symposium referred to above, Ghosh advocated (he had done so even before) the adoption of the terms 'Pebble-Core', 'Flake' and 'Flake-Blade', which he said was based on cultural-traditional units placed in a sequential framework, both geological and archaeological (*A.K. Ghosh, 1973, pp. 23-31*). Opposition to 'Early, Middle and Late Stone Ages' came from other directions as well in the Symposium. Sharma referred to his discovery of Upper Palaeolithic tools intervening between the Middle Palaeolithic and Microlithic in the Vindhya and the Ganga valley (*Sharma, 1973, pp. 106-10, 505-06*), there being no room for the interpolation of the Upper Palaeolithic either in Subbarao's scheme or in the scheme of 1961. In the Symposium Sankalia declared his present opposition to the 1961-scheme and preferred 'Lower Palaeolithic, Middle Palaeolithic and Microlithic' (respectively for Series I=Early Stone Age, Series II=Middle Stone Age and Series III=Late Stone Age), with 'Upper Palaeolithic' intervening between the last two (*Sankalia, 1973, pp. 504-05*). He has adopted these terms in his latest work (*Sankalia, 1974*). In the discussion that ensued, there was no unanimity.

The above gives a brief history of the prevailing confusion in the terminology of the Indian Stone Age industries without examining the relative merits of any set of terms. It shows the obvious need for an early standardization, as otherwise scientific communications among ourselves and with outsiders will be impossible.

*The committee consisted of : Dr. F.R. Allchin, Professor R.J. Braidwood, Dr. R.V. Joshi, Mr. V.D. Krishnaswami, Mr. B.B. Lal, Professor H.D. Sankalia, Professor B. Subbarao and Professor F.E. Zeuner.

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TWO

THE HARAPPANS AND RELATED ISSUES

Baluchistan & Afghanistan: Refuge Areas or Nuclear Zones?

2

S.P. GUPTA

BALUCHISTAN and Afghanistan have traditionally been visualized as refuge areas in archaeological literature. The purpose of this paper is to analyse, primarily on the basis of evidence from Aq Kupruk in northern Afghanistan (*Dupree, 1964, 1967, Dupree and Davis, 1974, Dupree and Kolb, 1975*) and Mehrgarh in Baluchistan (*Jarrige and Lechevalier, 1977*) that the region as a whole could independently witness the transition from mesolithic to neolithic and thence to chalcolithic. There is no great value in the general emphasis on the arid character of this land : the rivers in the area, the Oxus, the Helmand, the Zhob and others could sustain perennial agriculture in their valleys, perhaps on a small scale but effectively enough to generate cultural growth in these basins.

Northern Afghanistan

Aq Kupruk : The important site in Afghanistan is near the town Aq Kupruk in northern region. Aq Kupruk is located in the limestone hills south of the famous town of Mazar-i-Sharif which overlooks the Oxus. Louis Dupree, the excavator, laid trenches in three rock-shelters (called Ghar-i-Mar or Snake Cave, Ghar-i-Asp or Horse Cave, and another cave called Skull Cave by the excavators since here was discovered a cemetery of 10 burials) and one open-air site. The archaeological remains begin with Mousterian tools and end in the Early Islamic pottery but with several stratigraphic gaps. We are here concerned with the change from the Mesolithic to the Neolithic and different stages within the Neolithic itself.

The northern slopes of the Hindu Kush merge into the flood-plains of the Oxus. It has some small rivers rising in the Hindu Kush and joining the Oxus. The region gets rain only in winter; the summers are hot and practically rainless. It is in the winter rains that the narrow corridor, that exists between the river and the mountains, becomes fertile and it is possible that wheat and barley grew in the Neolithic period in varieties which were easily domesticated. The same applies to cattle, goat, sheep, etc., which were also domesticated here at a very early date. The evidence of all these comes from Aq Kupruk sites. Broadly, the sequence of Neolithic Cultures at this site includes an aceramic complex, followed by a ceramic complex. The aceramic level has further been divided into

Phase A, earlier, and Phase B, later.

Therefore, the change that we are trying to find out begins in Phase A of the aceramic period dated to 8000 B.C. ($10,210 \pm 235$ B.P.), a date which is comparable to many early dates of the Neolithic levels in west Asia and elsewhere. Although the remains of houses have not been found, hearths and floors yielding bones of domesticated sheep, goat and cattle, and a variety of horse (*Equus Caballus*) have been found.

Similarly, although agriculture has not been attested, pecked stone hoes, celts, querns and pounders have been found, which may have been used in harvesting the wild varieties of cereals and reducing them to flour. The excavator mentions the discovery of Upper Palaeolithic type blade tools. Interestingly enough, a fragment of a steatite bowl has also been found. On the whole, therefore, we are here dealing with a very early stage of settled life depending on a kind of economy in which wild cereals and domesticated animals played the important role; trade in terms of steatite or steatite bowls was obviously restricted. Art activity was confined to a pebble of limestone which was shaped into a man's head with rough facial features incised with a burin.

Phase A appears to have been followed by some climatic change as has been inferred by the excavator on the basis of a change in soil. Phase B has yielded the skeletal remains of the same species of domesticated animals as were encountered in Phase A levels. The stone tools also remain the same with large numbers of backed blades, burins and side and end-scrapers. Bone points and incised bone spatulas are, of course, the novelties. One most significant find is, however, a crude stone sculpture—that of a pregnant woman. Phase B is bracketed between 7000 and 5000 B.C. (8650 ± 100 B.P. and 7220 ± 100 B.P.)

The aceramic Neolithic was followed by a ceramic Neolithic. Two kinds of pottery were found—(a) a crude, soft, chaff—lime stone-and crushed-sherd-tempered ware in which pots with flat bases and simple rounded rims have been found, (b) a better fired ware with pots like simple bowls and jars, decorated with zig-zag incised designs. Dupree has compared them with the Neolithic pottery of Soviet Central Asian steppes, dated around 5000 B.C. Stone tools of the earlier tradition continued to be made. We have here flint cores, blades, sickle blades, perforators, end-scrapers, etc. Animal bones recovered clearly prove that sheep, goat, cattle and onager were domesticated. But probably a much more significant discovery in these levels is a fragment of beaten and embossed bronze sheet along with some fragments of a bronze rectangular rod at Ghar-i-Mar. Their tin content has been rated to 7 per cent. The ceramic Neolithic of Aq Kupruk belongs to the time bracket 5500-4000 B.C. (7030 ± 100 B.P. and 6310 ± 70 B.P.), while the metallic objects are dated to 5500-5300 B.C. Bronze objects of such an early date are not known from west Asia although copper objects have been found in the 7th millennium B.C. levels at Cayonu in Turkey.

Then the site was deserted for a very long time. The Late Neolithic people of 2nd millennium B.C. (3780 ± 130 B.P.=1830 B.C.) occupied a site called Dara-i-Kur, near Chenar-i Baba Daravesh. It is called Goat Burial Neolithic because in this site ceremonial burials of goats were found. The grey ware from this site has sometimes been compared with that found at Burzahom, near Srinagar.

We have thus in northern Afghanistan a unique situation with regard to Neolithic which began around 8000 B.C. It continued upto 2000 B.C. or so, passing through three different stages : aceramic, ceramic and chalcolithic. Louis Dupree, therefore, rightly observes :

Aq Kupruk may prove to have been in the zone of the early domestication of plants (wheat/barley) and animals (sheep/goat/cattle). Undoubtedly, there is hardly any chronological priority for west Asia over south Asia in the sphere of the beginning of Neolithism.

Northern Baluchistan

Mehrgarh : Although Afghanistan found a definite place on the map of Early Neolithic in 1972, yet Baluchistan remained outside it till recently. The discovery of a pre-pottery neolithic complex at Kile Gul Mohammad near Quetta had not taken us sufficiently near to Afghani, West Asian and Central Asian examples and all along we have been thinking that possibly the Neolithic in Baluchistan is very late, not earlier than the second half of the fourth millennium B.C., at any rate.

However, in January 1977 a startling discovery was made by J.F. Jarrige at Mehrgarh located some 150 km. southeast of Quetta on the Bolan. It has yielded the remains of a pre-pottery neolithic culture, called Mehrgarh Aceramic Neolithic Culture (the aceramic neolithic cultures are sometimes called 'Proto-neolithic' also).

The site of Mehrgarh spreads over 100 acres but during the neolithic period, only the northern and eastern sides of the site were occupied; the other sides were inhabited during the succeeding period, the chalcolithic. The interest in the neolithic settlement of this site lies in several factors. The first is its location which lies at the head of the Bolan Pass, the most popular route connecting India with West Asia throughout history. Secondly, it is on the bank of a perennial river, *i.e.*, the Bolan. Thirdly, the cultural deposit is abnormally thick (some three metres) in comparison with other neolithic deposits in south Asia. Fourthly, it is completely devoid of pottery. Lastly, from the earliest period the houses were made of mud and mud-bricks.

The excavations were undertaken near the edge of the mound overlooking the river. Two structural levels were uncovered of which the lower one is better preserved. In this level a small quadrangular room communicating with another one lying outside the limits of the dig has been exposed. The walls were built of mud-bricks bearing finger marks ; significantly, the marks of this kind have not been noticed on any of the bricks used in the structures of the chalcolithic period. One polished stone-axe is said to have been found close to the surface while two others were picked up on the surface itself. It is likely that these three axes formed part of the stone-tool assemblage of this culture. From the excavations a few stone adzes have also been recovered. This assemblage also includes finely retouched small blades and microliths which may demonstrate the fact that the Mehrgarh neolithic followed closely the mesolithic. The absence of pottery may also support this view. The neolithic assemblage of this site also includes many grinding stones and pestles, fragments of stone bowls, one ochre coloured stone spatula decorated with incisions and several bone tools of good quality. Stone beads have also been found.

But possibly much more significant is the discovery of a large number of cattle bones which proves beyond doubt that domestication of animals formed a major source of the economy of the people.

So far no information has been received on plants and cereals but the very presence of grinding stones, pestles and stone bowls shows that agriculture may have been practised. Our guess is that the oldest occupational stratum is dated to the 5th or 6th millennium B.C., if not earlier.

Mehrgarh Early Chalcolithic

In the southern part of Mehrgarh, the excavators found the aceramic deposit overlaid by a chalcolithic deposit yielding an enormous quantity of potsherds, 50 percent of which were wheel-thrown. It is significant to note that some of these pot-sherds were decorated with a few geometrical designs painted in black which are comparable with some of the crudely painted geometric motifs found on Kile Gul Mohammad II handmade unslipped pottery. The same observation applies to some of the mat-impressed pottery. It may be noted that Rana Ghundai I also yielded flakes and blades of chert along with bone points or awls and handmade pottery decorated with geometric designs of comparable compositions. Loralai I is also comparable to it. It means that we are here in the chalcolithic period dated to the later half of the 4th millennium B.C. It is also significant to note that the later levels of the chalcolithic Mehrgarh II have yielded painted pottery of Early Togau type displaying fine caprids and birds.

But what is much more important to note at Mehrgarh is the discovery of a mud-brick house in the lowest levels of the chalcolithic whose floors were coloured with red ochre. Nearer home, this has been a characteristic feature of the ceramic Neolithic and Early Chalcolithic houses in South Turkmenia. Associated with this floor, three atypical pot-sherds, presumably handmade, were found. Does this level, therefore, belong to the transitional phase, from the aceramic neolithic to the ceramic neolithic? Are the atypical pot-sherds the products of a purely local experiment in pottery making? Should we take it as a distinct stage of culture? It is probably too early to answer these questions in any way. But it may be noted that along with this early pottery a number of bone tools and stone blades have been found and all of them show affinities with the bone and stone tools of the earlier aceramic neolithic stage. It may mean that although at Mehrgarh we may or may not be missing a stage in between the aceramic and early chalcolithic, one may reasonably argue that at the end of the aceramic stage, a culture-contact situation arose in which progress was accelerated and many things happened in quick succession, often dove-tailing into one another. Thus, South Turkmenian fashion of painting the floors with red ochre reached Mehrgarh.

Sometimes during this period, neolithism appears to have arisen locally or moved into the Gomal Valley from some other area, reaching sites like Gumla.

The Neolithic occupation (period I), laid on the virgin soil, has not yielded any structural remains but community ovens, bones of domesticated animals (cattle) and microlithic blade and flake tools as also saddle querns, grinding stones, pestles, balls, pounders, etc., go a long way to show that Mesolithism was left behind by the people sometime back and neolithism was ushered in. It is likely, that it inspired a chain reaction which gave birth to the neolithic complexes of Sarai Khola and Jhang in the Potwar region and Jalilpur, in District Multan, some sixty km. south of Harappa. But it is only a guess because beyond Gumla, this neolithic is associated with pottery. There may be a few other sites also yielding polished stone-axes, chert blades, bone tools and handmade coarse and burnished wares, some of which resembled the Kile Gul Mohammad Ware of period II, as they do at Sarai Khola. Mehrgarh II may, therefore, belong to the Kile Gul Mohammad II times.

However, it is possible that Mehrgarh II is divisible into 'lower' and 'upper' levels, and the lower levels belong to early Kile Gul Mohammad II times. The situation we visualize is as follows :

- (a) Mehrgarh I, lower level, (b) Mehrgarh I, upper level, + Gumla I, Kile Gul Mohammad I, (c) Mehrgarh II, lower levels (d) Mehrgarh II, upper levels, + Kile Gul Mohammad II+Rana Ghundai I+Loralai I+Sarah Khola I+Jalilpur I
 (e) Early Togau. These are the five successive stages, 'a' being the earliest and 'e' latest. From 'e' we enter into the chalcolithic.

South Asia vis-a-vis West Asia and Central Asia

Now, how this situation of the 6th and early 4th millennium B.C. fits into the overall picture of West Asia and Central Asia?

To begin with, so far no site comparable with Mehrgarh I has been found anywhere in Iranian Baluchistan, Seistan, Afghanistan and Central Asia, and Indus basin. It is only when one goes further west to the Zagros mountains that one comes across with situations like this. But the Zagros is too far to be considered the nuclear area of the Mehrgarh aceramic neolithic. It appears at the moment that Baluchistan stands as an independent zone of the birth and growth of the cultural process which changed the pattern of human life from the Mesolithic to the Neolithic. How early does it go in terms of calendar years, we do not know, but our guess is that it cannot be later than the 6th-5th millennium B.C.

But in the 6th millennium B.C. itself Djeitun Neolithic Culture in South Turkmenia had completely established itself. Could it then not inspire the Mehrgarh Culture? However, it does not appear to be so since on the one hand the distribution of the Djeitun sites is confined to southern Turkmenia and southern Uzbekistan, and on the other, it is marked by a much higher stage of culture than we meet at Mehrgarh. Besides many objects of bone, stone and clay, such as needles, ball, cones, discs, animal and human figurines, it is marked by a beautiful handmade pottery, mainly round and carinated bowls decorated with groups of wavy and straight lines in ochrous red colour. It is, as we know, completely absent at Mehrgarh.

One may refer to another issue in this context. Archaeological discoveries during the last three decades have clearly shown that in the Orient, there have been two variants of Early Neolithism, one depending predominantly on pastoralism and the other depending predominantly on agriculture. The Djeitun Culture falls in the latter category while Mehrgarh seems to fall in the former. One may be tempted to argue that there are not two variants but two stages of the neolithic : pastoral nomadism followed by agricultural sedentarism. But the available evidence does not seem to support this proposition : their areas of distribution differ from each other; for example, Central Asian neolithic communities practising pastoralism inhabited the northern and eastern regions while those practising agriculture occupied the southern region.

The ceramic Neolithic without copper-bronze implements is, however, not a well-marked stage in Baluchistan. But that need not surprise us, since in many areas of West Asia the same thing happened; for example, at Cayonu, Braidwood discovered copper pins, etc., in the otherwise pure neolithic matrix of seventh millennium B.C. In all such cases, it should be noted, as Gordon Childe once wrote, that although such small items may have been fabricated or imported, yet they do not seem to have brought about any effective economic or technological change. In any case, from now onwards, the course of cultural history of Baluchistan got somewhat linked with the course of cultural history

of Iran and Central Asia. We must, however, hasten to explain the implications of the term 'linked' since in the past scholars like Childe, Piggott and Gordon created an impression in the minds of their readers that Baluchistan during this period, as also in later periods, served no more than a place of refuge for the Iranians. Our present day understanding of the cultural dynamics of Baluchistan clearly shows that culture in this part of the world developed on its own terms, and evidence of ceramic similarity sometimes in typology (but more often in decorations) between Namazga, Shahr-i-Sokhta, Tepe Yahya and Quetta—Nal complexes cannot be unduly emphasized. While similarity in certain geometrical designs may be only incidental because most of them appear to have been the copies of decorative designs on basketry, the faunal motifs largely depend on the figure of goat and bull, common enough animals in any context.

Therefore, although Fairservis and others draw attention to the evidence of pottery as found at Sialk, Hissar, Chashma Ali, Bakun, and other places, yet the detailed study of pottery shows that in many cases the goat and bull may have been depicted locally without being inspired by a foreign inspiration. In some cases the mobility of the people may have increased considerably the exchange of ideas and goods, but pottery perhaps was rarely involved as it is both difficult and uneconomical to carry pots over long distances. It is hardly necessary to emphasize that economic and intellectual interaction is not the same thing as colonization or infiltration of a region by the population of another region.

Southern Afghanistan

Mundigak I : Early Chalcolithic complex : In southern Afghanistan we have as yet not been able to locate any site of the aceramic neolithic group and, therefore, we are unable to state if this part of our region was also inhabited during the sixth or fifth millennium B.C. The best known site excavated so far in this area is Mundigak, located north of the modern city of Kandahar. The city is situated at the foot of Koh-i-Baba range where the Argandab River flows into the plains. The Argandab eventually joins the Helmand river near Lashkari Bazar. Besides Mundigak, the sites excavated in this region are Deh Morasi Ghundai and Said Qala Tepe but Mundigak still remains to be the most imposing one.

The twenty metre high mound of Mundigak lies on the caravan route to Herat, which connects Afghanistan with northern Iran and southern Turkmenia as also Seistan. The sequence of protohistoric cultures at the site passes through seven stages or period of which first or lowest is marked by rectangular mud and mud-brick houses. The main rooms contained hearths in the centre, while the side rooms of some of the houses have yielded the evidence of ovens or kilns for making pottery. The pottery was handmade and also painted. On the basis of the decorative designs and a few shapes, the excavator shows the affinity of this ware with that found in Period II of Kile Gul Mohammad in Quetta as also at Hissar in northern Iran. It, therefore, appears that we are dealing here with an early third millennium or late fourth millennium B.C. culture. Casal, the excavator, feels, and Fairservis endorses his views, that the culture-complex of Period I may have come to the site as a ready-made item from somewhere else. This parent region has not been defined. We would, however, like to suggest that the impetus would come from the Quetta Valley where an earlier phase of the neolithic has been located at Mehrgarh

and Kile Gul Mohammad. Even the early stages of chalcolithic in Afghanistan and Baluchistan appear to have been evolved in this part of South Asia itself.

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The Indus Civilization: New Evidence from Pakistan

3

JIM G. SHAFFER

THE YEARS 1964 and 1965 were particularly significant for protohistoric studies in Pakistan. These years witnessed publication of the very important excavations conducted at Amri (*Casal, 1964*) and Kot Diji (*Khan, 1965*). Both sites produced an impressive corpus of material remains which were seemingly "non-Harappan" in character, and stratigraphically situated below Mature Harappan deposits. The precise relationship which existed between these Kot Dijian and Amrian cultures, and their generic, or non-generic, relationship with the Mature Harappan has been a point of spirited discussion in recent years (e.g. *Mughal, 1970, 1973 ; Gupta, 1972*). Whatever these relationships may turn out to be, excavation of these sites represents a fundamental contribution to South Asian archaeology in that they provide information about "non/pre-/Early Harappan" settlements in the Indus Valley proper. Because of their importance, these excavations have been summarized in all recent archaeological overviews of this area (*Allchin and Allchin, 1968; Fairservis, 1975; Sankalia, 1974; Wheeler, 1968*), and need not be repeated here. Since 1965 there have been, however, excavations conducted at several protohistoric sites in Pakistan which have greatly contributed to the spectrum of knowledge concerning these, and other, relationships which existed in the Indus Valley proper. The focus of this paper will be on these subsequent excavations and developments which have not yet been incorporated into general summaries.

A basic division may be made among these most recent excavations. First would be those directed toward examining "non-Harappan" settlements which were either earlier or contemporary with the Mature Harappan. In this group would be the excavations at Gumla (*Dani, 1970-71*), Sarai Khola (*Halim, 1972a and b; Mughal 1972a*), Jalilpur (*Mughal, 1972b, 1974a*), and Nindowari (*Casal, 1966*). A second group would be those excavations directed toward examining the Harappan culture itself. Primary among these have been the excavations at Allahdino (*Hoffman, 1974; Shaffer 1974a; Hoffman and Shaffer, 1976*) and Balakot (*Dales, 1974*) both of which are not completed. There are, of course, other sites under investigation but they have not yet been adequately reported upon, therefore, this discussion will center on these sites.

Gumla

Historically the Gomal River was a major trade and communication artery linking Ghazni-Kandahar-Zhab regions of Afghanistan and Baluchistan with the Indus River regions. This area was explored by Stein who located some historic sites near the cities of Bannu (Surkh Derai, Chaudhwan, Chicha Derai, Dabra, and Shah Zaman Dherai) and Tank-Dera Ismail Khan (Lakhi Kot, Aba Kheil, Kot Pathan, Kot-kat Dherai). These sites were occupied by various 'known' cultural assemblages from about the time of Christ to 500 A.D. More recently this area was explored by A.H. Dani (1970-71), who revisited known sites, and discovered eleven new ones in the Tank-Dera Ismail Khan region: Gumla, Hathala, Karam Shah, Rahman Dherai, Hisham Dherai, Mahra Sharif, Musa Khel, Bud Ki Therai, Kot Allah-Dad, and Gomal Kalan. Several of these sites had pre-protohistoric occupations, and limited excavations were undertaken at two: Gumla and Hathala. The Hathala excavations were not completed limiting knowledge for this region to a single trench at Gumla.

Six (I-VI) major occupational periods were defined by Dani, but only the first four are protohistoric and will be discussed here. Unfortunately, Dani equated stratigraphic phenomena and changes in material culture with population movements. Although such interpretations are rampant in South Asian archaeology (e.g. Sankalia, 1974) they grossly oversimplify the complexities of cultural processes involved (see Shaffer, 1974b; *Chakravarti*, 1977). Should the full cultural, and statistical, complexities involved in interpreting occupational mound stratigraphy be taken into consideration (see Allahdino discussion) then there is little data supporting the various 'abandonments' and 'invasions' utilized to separate different Gumla occupations (or at other sites as well). Given this consideration a summary of the protohistoric sequence is presented here.

Period I. No structures were located in the trench, but there were several large, shallow, clay-lined, circular pits. A series of microlithic tools were found along with animal bones (domesticated?). Dani feels that this initial occupation might represent a pastoral nomadic encampment. Should the presence of pastoral nomads be confirmed by additional excavations then significant alterations must be made in current interpretative models for the Indus Valley.

Historically, all interpretative models of Indus Valley protohistory have assumed the existence of a single man-land relationship: that of sedentary agriculturist which develops into sedentary urbanite. Such a limited perspective creates a fundamental interpretative problem. That is, that as long as the conceptual unit of analysis is confined to a sedentary population then any cultural similarity between two such populations (sites) is usually explained in terms of diffusion (invasion, migration, etc.). In other words, for trait x to be found at sites A and B it had to be carried from one to the other by a member(s) of the sedentary population. Therefore, population movement is a corollary explanation for cultural similarities between assumed sedentary groups. However, if pastoral nomads are present then such cultural similarities may be interpreted as reflecting an integrated communication system linking disparate nomadic and sedentary population units instead of direct population movements, or cultural contacts, between two points. Furthermore, the presence of pastoral nomadism creates an entirely new set of man-land and man-man relationships which have not been adequately explored in South

Asian archaeology (or anywhere else). The role of pastoral nomadism has been almost totally ignored in pre-/ protohistoric explanatory models (see *Sheffer, 1972, pp. 150-250, 1974b*); and their integration into such models will significantly alter perceptions of cultural processes involved.

Period II. Material remains from this occupation are much more extensive. Mud-brick architecture, wheelmade ceramics and copper-bronze artifacts are found. A wide variety of decorative motifs can be identified on the pottery. Most distinctive for this occupation was a brown-on-white type with motifs strikingly similar to those found on Quetta Ware. Also present were black-on-red on-buff bichromes, and black-and-red on white polychromes executed in geometric motifs. A limited amount of similar poly- and bichromes was identified in Afghanistan at Said Qala Tepe (*Sheffer, 1971, 1972, n.d.*) in a Mundigak III₅-IV₁ context. A black-on-red slipped pottery was also present at Gumla. The predominant decorated vessel form was a small carinated bowl. Other important ceramics associated with this occupation were a few jars similar to Kot Dijian style pottery in shape and decoration, and a few examples of Quetta Wet type pottery.

Additional ceramic artifacts included bangles, gamesmen, toy carts and figurines. Humped bull/cow figurines were found as were two distinctive female figurine types. One type had the lower torso stylized as a trapezoidal cone/pyramid. The other type was a seated figurine, its bent legs extending out in front with pinched applique facial features and breasts. Similar figurines have been found at Said Qala (but not Mundigak), Namazga III (Turkmenistan, S.S.R. see *Masson and Sarianidi, 1972*), and Jalilpur II (Indus Valley, see below). Microlithic tools continue with the addition of a few new types, and elongated chert flakes occur for the first time. There are also indications that agriculture was practised.

Period III. A single mudbrick wall was the only architectural feature for this occupation. Associated artifacts demonstrate continuity as well as change from the preceding period. Among ceramics the brown-on-white type pottery with Quetta Ware motifs ceases to be important. There is a predominance of black/brown and red-on-white motifs applied to red slipped pottery. The most distinctive motif of this decorated pottery was the utilization of intersecting circles and cross-hatching. Most bowl and jar vessel forms are similar to those identified with Kot Dijian and Amran cultures. Of particular note in this respect was the presence of flanged rims on many decorated jars. Among zoomorphic motifs which occur on pottery of this occupation are a few examples of the so-called 'horned deity' found on Kot Dijian pottery (fig. 1).

Most other artifact categories were similar to those identified in Period II. The most dramatic exception to this continuity was a change in female figurines. Pinched facial features and applique breasts continue, and some have modelled arms extending down in front and holding a dish. These standing figurines are supported by a flat triangular foot extending out in front of the body (fig. 2).

Period IV. Most of the material culture found in Period III persists into Period IV.

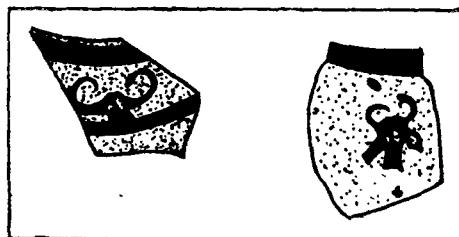


Fig. 1. Black-on-red slipped pottery from Gumla III with 'horned deity' motif (after Dani, 1970-71).

The major difference is the *addition* of artifacts usually associated with the Mature Harappan culture. Most important among these was a black-on-red slipped pottery decorated in the typical Harappan style. A mudbrick podium was the most prominent architectural feature of this occupation.

On the basis of the Gumla sequence Dani has identified the major protohistoric occupations at the other sites found by him.

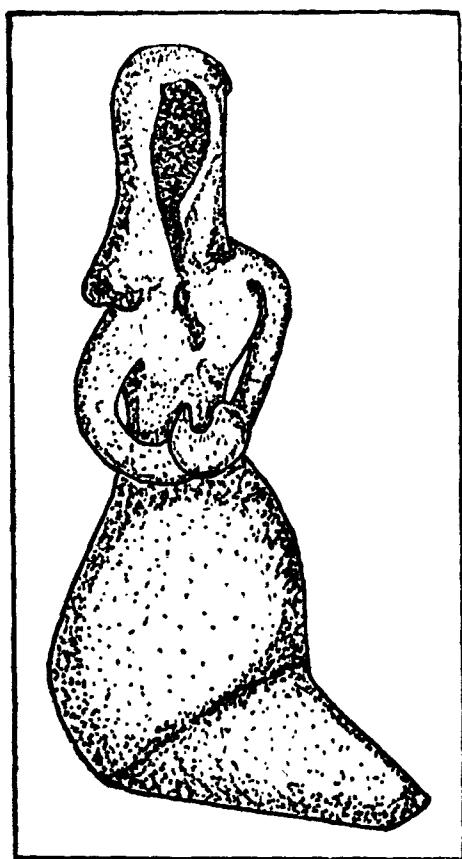


Fig. 2. Standing female figurine from
Gumla I-II after Dani 1970-71.

ons. This mound is located approximately 2½ miles southwest of Taxila near the Grand Trunk Road. Excavation at this site between 1968 and 1971 revealed a very important sequence of four occupation (Period I-IV). Only the first two occupation (Period I-II) are pertinent to the present discussion. Period III was a cemetery of iron using people and Period IV an Early Medieval Period settlement. Besides the cultural historical importance of the material remains recovered in these excavations also mark the introduction of statistical artifact quantification into Pakistan archaeology.

Period I. No evidence of any structural remains was encountered in the initial occupation. One of the most distinguishing artifact types found in this period were polished stone celts with ovoid or quadrangular cross-section. Other artifacts included flint microblades, scrapers, leaf-shaped points and bone points. Ceramic solid wheel and toy-cart frames have been associated with this period. However, it is the pottery which provides a diagnostic 'touch' to this occupation. This medium to thick walled pottery was handmade from a red paste. Vessel forms were predominantly that of a simple bowl with flaring walls. Exterior and interior wall surfaces had been burnished or at least smoothed. The exterior bottom of many vessels had the circular impression of a basket coil. This suggests that the clay vessel was constructed within a basket, removed when dry, and then

Karam Shah	Gumla III-IV
Hathala	Gumla IV-V
Rahman Dherai (one of the largest sites - 1700 x 1200 ft. x 15 ft. high)	Gumla III
Hisham Dheri	Gumla IV
Mahra Sharif	Gumla IV and later
Musa Khel	Gumla III
Bud Ki Dheri	Gumla IV (?)

Sarai Khola

The Sarai Khola excavations (*Halim, 1972a and b ; Mughal, 1972a*) significantly contributed to our knowledge of pre-/protohistoric periods in northern Indus Valley regions.

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Period I. No evidence of any structural remains was encountered in the initial occupation. One of the most distinguishing artifact types found in this period were polished stone celts with ovoid or quadrangular cross-section. Other artifacts included flint microblades, scrapers, leaf-shaped points and bone points. Ceramic solid wheel and toy-cart frames have been associated with this period. However, it is the pottery which provides a diagnostic 'touch' to this occupation. This medium to thick walled pottery was handmade from a red paste. Vessel forms were predominantly that of a simple bowl with flaring walls. Exterior and interior wall surfaces had been burnished or at least smoothed. The exterior bottom of many vessels had the circular impression of a basket coil. This suggests that the clay vessel was constructed within a basket, removed when dry, and then

the walls smoothed. There are striking similarities between this occupation and the Burzahom culture in Kashmir.

Period II. The transition from Period I to II was gradual and definable at the site. In several stratigraphic layers handmade pottery of Period I was gradually replaced by the wheelmade pottery which characterizes Period II. This new pottery was treated with a red slip, or wash, and decorated with a wide band of black/sepia paint around the neck. In the final occupations of Period II loops and horizontal wavy lines were added to the basic neck band decoration. More rarely found were broad pipal leaf and arrow motifs. Several new vessel forms occur among the most prominent of which are elliptical jars with flanged, short, or everted rims. Many of these jars had their exterior surfaces fluted or grooved. Other forms included: bowls, flat dishes, ladles, knobbed pot lids and dish-on-stand. There are striking similarities between this period's pottery and that defined for the Kot Dijian culture. Additional artifacts reported from this period were: flint blades, scrapers and leaf-shaped points; grinding stones; cores; polished stone celts; stone chisels; ceramic sling balls; shell and ceramic bangles; ceramic humped/bull/cow figurines; ceramic toy-cart frames; bone points; stone beads (carnelian, agate and one of lapis lazuli); and, copper-antimony rods and needles.

Only a limited amount of structural remains were definable at the site. Identification of a series of post-holes in one occupation layer suggests that insubstantial habitation structures were present. Post-holes varied in size and shape, were filled with kankar and grit, and had decomposed remains in the center. Fire places and pottery concentrations indicate that habitation activities were conducted within the boundary of these post-holes. Unfortunately, excavations were too limited to define an overall shape for the structures. Several examples of prepared clay floors were found, and a single example of a stone wall.

Jalilpur

The site of Jalilpur (*Mughal, 1972b, 1974c*) is located 46 miles southwest of Harappa, near the junction of Chenab and Ravi rivers. The site actually consists of two mounds. Mound A, the largest, is actually a dense clustering of smaller mounds (approximately 500×700 ft. and 18 ft. high), whereas Mound B is a single small (200 ft. in diameter and 5 ft. high) mound located to the northwest. The area between the two mounds is littered with pottery so that the total site dimensions are considerable (1400×1200 ft. and 15 ft. high). Some stamped medieval pottery was found on Mound A, but of primary concern here are two protohistoric occupations defined in the excavations.

Period I. Except for some examples of prepared floors there were no structural remains definable for this occupation. Pottery was handmade from a red paste, and the primary vessel form was a globular jar with a very short neck. The exterior surface on many vessels was slipped with a very coarse clay applique somewhat reminiscent of the early pottery from Amri I. Other artifacts included chert blades, bone points, net-sinkers, and beads of terracotta and sheet gold.

Period II. This occupation was divided into two structural phases - IIA and IIB. The major architectural difference was that the small rooms of IIA were constructed from pise whereas in IIB mudbrick (dimensions 18×9×3 inches) was used. A fine wheel-made pottery with striking bichrome decorations was found in this period, and in the final levels of Period I indicating a gradual transition. Several color combinations were

found on these bichromes including black-on-red slip; black/brown-on-red surface; black and white-on red; and, black and red painted combinations. The motif repertoire was extremely rich and varied including both zoomorphic and geometric elements. In addition, sandy slipped and striated types similar to those from northern Baluchistan were also found. A few examples of Quetta Wet type pottery, also from Baluchistan, were identified. Vessel forms included a globular jar with a short neck which was often decorated with a black/brown band, and had the exterior surface fluted or grooved. Other forms identified were: globular jars with flanged rims, carinated bowls, knobbed pot lids, and dish-on-stand. Many parallels may be seen between the Jalilpur II pottery and that of Kot Diji, Sarai Khola II, Gumla II-III and the Sothi pottery from Kalibangan. A single collared jar with black-on-white geometric decorations had design elements similar to the protohistoric pottery found on the Iranian Plateau proper (fig. 3).

Humped bull/cow and female figurines were found. The female figurines are seated and comparable to those identified at Gumla II (Fig. 4). Other ceramic artifacts were beads, toy-cart frames, bangles, and cakes. Lithic artifacts included : grinding and pounding stones; chert blades and leaf-shaped points; and beads (including several fine lapis lazuli examples). Copper or bronze rods were also present.

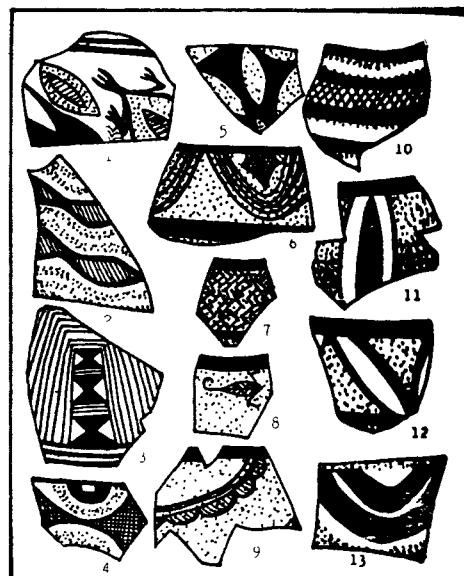
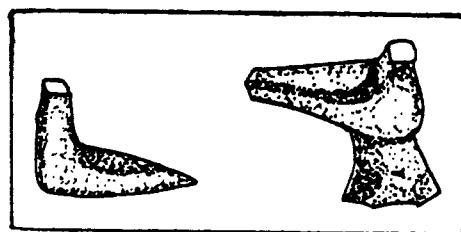


Fig. 3. Jalilpur II pottery. Nos. 1-4: Black and-red on buff surface; Nos. 5-9: Black-on-red slipped Nos. 10-13 Black-and-red and-white Polychromes. (after Fairservis, 1975, p. 436)



Allahdino

Fig. 4. Seated figurines from Jalilpur II. (after Mughal, 1974a)

Since 1973, Fairservis has directed excavations at Allahdino, a Mature Harappan site (also known as Nel's Bazaar). Although the site is still under excavation, a brief summary of the work accomplished to date is presented here (see also Hoffman, 1974; Shaffer, 1974a; Hoffman and Shaffer, 1976). It should be remembered that the interpretations presented here are tentative, subject to change until the analysis is completed, and reflect primarily the views of this author only.

Allahdino is about 25 miles east of Karachi, approximately 10 miles east-northeast of the confluence of the Indus River and the Arabian Sea, in-between the seasonal Bazaar and Malir channels. The site is a low mound 10 to 12 feet above the surrounding fields with a diameter of approximately 300 feet. Today the region is a desert made agriculturally productive only through use of modern pump irrigation. Monsoonal rainfall is light and variable, and there is little indication that any significant environmental changes had

altered the ecology during occupation of the site.

Excavations were undertaken with multiple objectives which significantly influenced the methodology used. A prime objective was to sample a 'non-urban,' or small, Mature Harappan settlement in order to expand our knowledge about the entire settlement spectrum for this culture. Secondly, delineation of the *internal* settlement pattern at the site has been attempted to determine if functional and/or social differentiations existed. To accomplish this latter objective an extensive, and intensive, system of artifact recovery and quantification was maintained. That is, *all* excavation fill was screened through $\frac{1}{4}$ inch mesh, and all fragmentary and complete artifacts were analyzed and tabulated. Through such quantitative techniques it was also hoped that a more systematic artifact typology could be developed to alleviate the present subjective and chaotic state that prevails in Harappan typological studies. These considerations have been paramount throughout the four years and approximately 39,204 ft.² of excavation.

Although horizontal exposure was the primary objective, a sondage (approximately 33×15 ft. and 13.2 ft. deep) was made to determine the nature and extent of previous occupations. Utilizing architectural/pedological, ceramic and lithic changes six distinct occupations were determined which could be grouped into three major occupational 'phases'. The major occupational/architectural characteristics are summarized here (note : until the final report is published the field designations will be used which are from top to bottom : i.e. Phase 1 is the *last* occupation).

Phase 1. A shallow upper occupation of pise and mudbrick walls truncated and highly eroded were defined. The second occupation was the principal architectural phase exposed by the excavations. It consisted of mudbrick and/or stone architecture which underwent continuous rebuildings. Several distinct buildings were defined some of which were associated with extensive hydraulic systems and, perhaps, different functions.

Phase 2. These two occupational levels were identified only in the sondage. Mudbrick architecture was found in conjunction with other domestic and courtyard features, and post-moulds.

Phase 3. Possibly two occupations known only from the sondage. No architectural structures but several artifact-bearing pedological lenses. The lowest occupation was characterized by a concentration of chipped stone artifacts including microlithics.

Frequent fluctuations were observed for many artifact categories between different phases. The basic decorated pottery type in every phase was, however, the black-on-red slipped type usually designated as Mature Harappan. It is important to note that the *average* frequency of this pottery type was only 0.5 per cent per occupation, and never exceeded 1.5 per cent. Fluctuations in the frequency of other ceramic types and vessel forms were determined between different phases, and originally interpreted as reflecting change through time (*Shaffer, 1974a*). In the lowest occupation there was a significant increase in the number of chipped stone artifacts which suggested a functional contrast to the other occupations (*Hoffman, 1974; Hoffman and Shaffer, 1976, p. 103*). There was a higher frequency of pointed tools and a lower frequency of blades. Moreover, 'microlithic' lunates were confined to these lower occupations.

The major Phase 1 architectural features are shown in *Fig. 5*. By far the most commonly used construction material was mudbrick usually coated with a mud plaster. Mudbrick walls varied in thickness from one to three courses, utilized a construction pattern involving headers and/or stretchers, and occasionally were set in shallow wall trenches.

Stone masonry was utilized for foundations of large walls, pavements, wall repair and drains. Stone foundations were sometimes placed in wall trenches and reached heights of over 5 feet. Small stones and cobbles were used in repairing mudbrick walls but were never lain with the same care as in the other types of structures. It is interesting to note that all hydraulic features (wells, drains, pavements) are associated with stone masonry, but all stone masonry is not hydraulic in association.

All buildings are square or rectangular shaped and sub-divided into multi-compartments. The apparent 'regularity' perceivable within and between architectural units is "...probably more a result of the rectangular mudbrick building blocks than any 'central planning' or regulation" (Hoffman and Shaffer, 1976, p. 101). The large structure in the northwest part of the site, and the smaller, squarish structure immediately to the south,

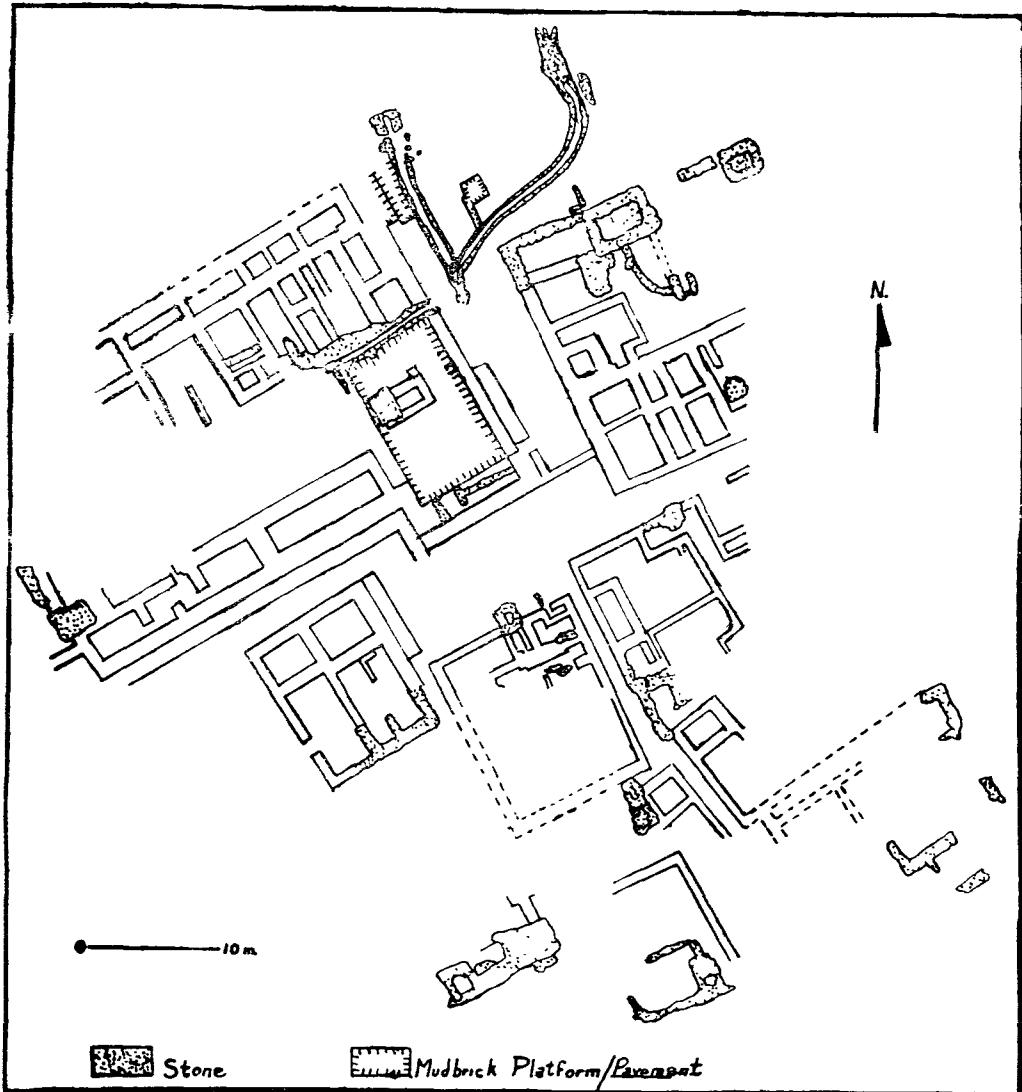


Fig. 5. Architectural features of phase 1, Allahdino (after Hoffman and shaffer, 1976)

appear to be non-residential in nature. The larger structure has a large mudbrick platform, a stone pavement connected to a large stone tank or well, and standing mudbrick walls of over 6 feet. The open stone drains which empty onto stone pavements to the north have not yet had their exact stratigraphic association firmly established. A large kiln or oven, is the dominant feature of the smaller structure. The large multi-room structure in the north-east has not yet revealed its precise function. A prominent feature of this structure was a stone-covered drain which fed into a small stone masonry unit with external drain and stone-paved floor. Immediate to the south of this structure is a large multi-room unit which appears to be the major habitation area. This unit is separated by a street from another large complex of units whose function remains to be determined. In this group the outstanding feature(s) is a series of three stone wells aligned with one another. The northernmost well was found to extend down into virgin soil, and linked to a ceramic basin on top.

The methodology of analysis and quantity of artifacts recovered necessitated an extreme division of labor among the archaeologists involved. Since the site is still under excavation and analysis, it is difficult to make exacting comments about the results. One basic fact which has emerged is the staggering quantity of *all* artifact categories. Such items as biconical ball, ceramic bangles, toy-cart frames, terracotta triangles and cakes have been found in quantities exceeding 10,000 each (inclusive of whole and fragmentary examples). Likewise there has been a surprisingly large number of metal objects (over 1,000 inclusive of amorphous and definable objects) including functional and luxury objects. Some examples of gold and silver objects have also been identified. Semi-precious stone beads, shell objects, seals and examples of Harappan script have all been found in very significant quantities. One type of Harappan artifact noticeable by its total absence is that of female figurines. As expected the quantity of ceramics is quite large, and to date more than 300,000 sherds have been analyzed.

Although analysis is still in process, a few additional comments may be made about ceramics since the responsibility for this artifact category is the present author's. Wheeler (1968, p. 68) has noted the chaotic state of knowledge surrounding Harappan ceramics. The emphasis of the Allahdino study, therefore, has been on devising a descriptive typology based mainly upon variables of paste, surface treatment, vessel form and size. It was hoped that by quantifying these multiple variable clusterings would occur and ultimately result in determination of a systematic typology. In addition, by combining this analysis with the horizontal distribution of different types throughout the site it was hoped that non-random clustering could be determined. Furthermore, once determined these clusterings could be combined with other artifact and architectural analysis to indicate functional and/or social differentiations within the site, and within the artifacts themselves. To date the analysis has revealed some clusterings. Significant associations between various surface treatments, pastes, vessel forms and sizes seem to exist within the ceramic assemblage. Likewise, there is, for some types, a non-random horizontal distribution throughout the site. Even more striking has been the differing horizontal distribution of bowl : jar ratios and average sherd size (based on weight per sherd) within the site. For example, jars are ten times more frequent in the large non-habitational northwest structure than in any other area.

Similarly, the average sherd size is significantly smaller within the southeastern habitation area. Another interesting fact is that even with the increased sample size for

Phase 1 the relative frequency for the typical black-on-red slipped decorated Harappan pottery remained below 1 per cent. More importantly, many of the frequency fluctuations and ceramic changes recorded in the sondage, and interpreted as representing change through time, were duplicated by the horizontal distribution of pottery within Phase 1. This latter factor has two important implications for archaeology. First, much more caution needs to be imposed upon the existing assumption that stratigraphic ceramic changes represent chronological-cultural changes. Such changes may represent instead shifting functional variation within a site for varying periods of duration. Second, these factors question traditional archaeological approaches to stratigraphic interpretation. That is, most archaeologists perceive occupational mound stratigraphic units as a chronological event with cultural implications making no allowance for intra-site functional variation. What is argued here is that stratigraphic units should be treated primarily as cultural events which may, or *may not*, have significant chronological implications. This author feels that much of the confusion which abounds in South Asian archaeology is a result of the strict 'layer-cake' approach to stratigraphy, and the chronological based interpretations which follow. It must be emphasized that occupational mounds are, by their very existence, totally a cultural artifact, and that stratigraphic conceptions and assumptions developed in geology may, or may not, apply (see Hoffman, 1974; Hoffman and Shaffer, 1976, pp. 96-9).

Other Developments

There are several other archaeological excavations which are, or have been, conducted in Pakistan but not discussed here. Many of these sites have not been fully reported upon, or are still under excavation, and can only be briefly mentioned. Fairervis' work in the Las Bela has been adequately summarized by him (1975) and need not be repeated here. In the same region the Kulli site of Nindowari (*Casal, 1966*), in the Ornach, promises to provide important information about this poorly understood cultural complex. Besides the well known style of pottery and female figurines this site also has extensive remains of monumental stone architecture. It is possible that this site may represent a settlement of some specific cultural importance since for this culture there are few habitational remains. Casal's excavations indicated that the Kulli and Harappan cultures were contemporary. Equally important was the location stratigraphically below the Kulli occupation at this site of some black-on-buff geometrically decorated pottery similar to that found at Nal.

In the Northwest Frontier Province, the University of Peshawar has recently been extremely active. In association with Temple University (Pennsylvania) Peshawar has re-examined the stratigraphic cut at Sangho Cave, and tested some new areas. At Bannu Peshawar University located, and tested, a site which had remains similar to Gumla II-III. Most important are the recent excavations by F.A. Durrani at the large site of Rahman Dherai near Dera Ismail Khan. This huge site on the Gomal Plain with its Gumla type remains promises to be one of the most important sites in the Indus Valley. Another relevant piece of work was the recent survey by the Department of Archaeology in Baluchistan (*Mughal, 1974b*) which re-examined the Quetta Valley sites and located several new ones.

George Dales (University of California) has been excavating the Mature Harappan

site of Balakot (*Dales, 1974*). This 'typical' Mature Harappan site, near Karachi on the coast, has revealed extensive deposits of non-Harappan type material (Nal, Kalat and Amri type pottery) stratigraphically below that of the Harappan. The horizontal excavations and extensive ecological analysis at this site will provide important new information about the Mature Harappan, and, at the same time, will be an important comparsion for similar studies conducted at Allahdino. Equally important for understanding the Mature and Late Harappan Period will be the extensive site survey and settlement pattern analysis done by Mughal in Bahwalpur which will soon be published. Finally, a comprehensive functional study of all the lithics from excavated protohistoric sites has been undertaken by Jamie Cleland (University of Virginia). This study will add significantly to our knowledge of this often neglected artifact category.

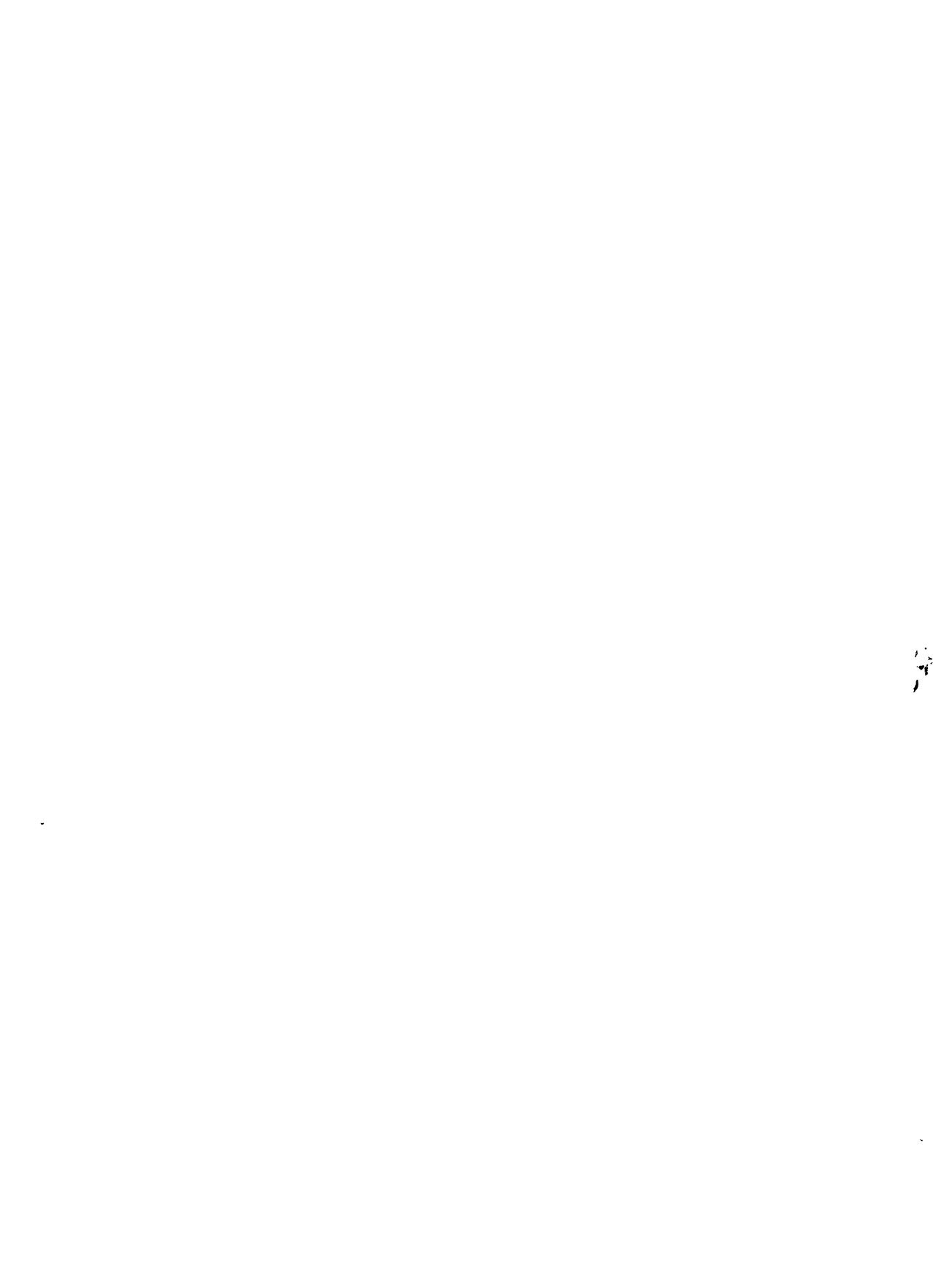
Since most of this recent research is still in its preliminary stages, it is difficult to integrate it into traditional over-views of the Indus Valley. Certainly this work has demonstrated that before the Mature Harappan Period the Indus Valley had been settled by several groups presumably with a food-producing economy. Regional variations may be defined among these groups, but there are also distinct similarities among many artifact categories such as ceramics. It is clear that some form of cultural communication was being maintained within the Indus Valley. The basis of this communication, however, remains problematical. Furthermore, there is increasing evidence of regular communication with at least southern Afghanistan during this period. The similarities between the Sarai Khola material and that of the Burzahom in Kashmir certainly indicate communication with northern areas. This northern communication is also substantuated by a Kot Dijian style jar with a 'horned deity' motif found at Burzahom, Period II (*Sankalia, 1974, p. 303*). The cultural and chronological implications of this discovery have yet to be fully assessed. The work on the Mature and Late Harappan Periods is still too preliminary to evaluate. However, there is little doubt that when it is completed it will provide some dramatic new perspectives on Harappan culture.

Perhaps the most significant development in Pakistan protohistoric archaeology is not to be found as much in new data as in the new questions and methodologies introduced since 1965. Primary among these developments has been a growing emphasis upon ecological reconstructions and relationships. The Allahdino and Balakot excavations are particularly important in this regard since extensive flora and fauna studies are being conducted. Concomitant with ecological reconstruction has been a shift away from the simple site survey to studies directed toward determining settlement patterns and changing man-land relationships. The Bahawalpur study will be particularly important for these aspects of Harappan investigations. Equally important has been a realization that stratigraphy, although important, is not the only goal of excavation; and, that it has severe limitations in the types of questions and answers that can be distilled from it. This realization has resulted in the current emphasis upon horizontal excavations. The other major development has been extensive quantification of all artifact categories. Quantification, hopefully, will remove much of the subjectivity and chaos which permeates South Asian typologies and interpretations. In summary, then, many significant changes are foreseen when the current studies are completed, and we can expect some dramatic revisions to be made in South Asian protohistory.

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*Indus-Mesopotamian
Trade: Nature of Trade
and Structural Analysis
of Operative System*

4

SHASHI ASTHANA

TRADE and Trade-mechanism between India and Mesopotamia attracted the attention of scholars with a great zeal the day Mesopotamian clay tablets containing references to Dilmun, Magan and Meluhha were studied in depth and the suggestion was made that Meluhha is to be identified with the Indus Valley (*Leemans, 1960*). Two kinds of researches followed—one concerned itself with the locational study of the three areas (*Thapar, 1975*) and the other with the items of trade system underlying the trade-mechanism (*Mallowan, 1965; Chakrabarti, 1977*). While the former falls primarily in the domain of paleo-geographers, historians and linguists, the latter moved into the fray several archaeologists (*Kohl, 1975; Lamberg-Karlovsky, 1972; Shaffer, 1978; Dales, 1976; Lamberg-Karlovsky & Tosi, 1973*). However, both these researches have largely been complementing each other and therefore remained valid for the structural analysis of the operative system underlying the Indus-Mesopotamian trade. In the following pages an attempt has been made to formulate a model in which the structural analysis may become more meaningful than hitherto.

To begin with, in the context of Indus-Mesopotamian economic interaction, we visualize a multi-tiered structure as against simple two-tiered structure of pre-urban societies. This multi-tiered structure has two major components—the Productive Unit and the Distributive Unit, each further divisible in a number of sub-units. In this whole structure one element which has been fundamental to the operative system is ‘agent’ but it has not attracted sufficient attention of scholars. The contemporary literary evidence of ‘agents’ and ‘agency system’ is ample (*Leemans, 1960, pp. 140-42*). It gives us a clear idea that the “traders, Akkadian, Iranian, Indian . . . behaved in much the same way as merchants do the world over today” (*Mallowan, 1965, p. 6*). Today, except for very localized transactions, we can hardly visualize ‘producer-consumer’ trade-system. Between the producers and the consumers, now a chain of expertise, including that of the transporters, look after the interests of the two parties, but the expertise of the authorized agents, who look after the profit and loss aspect of the transactions or who share the profits and also bear a part of the losses, is always vital. It is to this organ of trade-

operation that we will focus the attention of scholars. Since no proper appreciation of this organ of trade is possible in isolation, we will present briefly an overall picture of the third millennium trade and the operative structure within it.

I

In recent years, our knowledge about the extent of the Harappa culture has increased considerably which has a direct bearing on the long distance Harappan trade as well as the highland-lowland interaction for economic needs. Thus, beyond the Indus Valley, we have now (*Lyonnet, 1977, pp. 19-35*) a cluster of seven sites at Shoturgai, near Ai-Khanum, northern Afghanistan on the Oxus-Kokcha confluence. Its location is so strategic that it must have controlled the import of lapis lazuli, turquoise, silver and other minerals and metals from Afghanistan and Soviet Central Asia and northern Iran required for the highly industrialized economic pursuits of the Harappans. Similarly the discovery of Manda—a site in the Himalayan foot-hills on the Chenab in District Jammu, near the modern town of Akhnoor (*Joshi, 1978, pp. 98-100*)—should be taken as a highland site controlling the inflow of Himalayan timber for the Harappans. Sites like Bhagatraw on the western coast must have provided semi-precious stones like agate, carnelian and chalcedony for Harappan bead-making factories. Metals, minerals and timber of northern Baluchistan must have come to the lowlands through a number of sites including Gumla (*Dani, 1971*) and Rahman Dheri (*Durrani, 1977*) in the Gomal valley. From southern Baluchistan men and material must have come directly to several places in Sind-Allahdino (*Hoffman and Shaffer, 1976*) and Balakot (*Dales, Cyclostyled copies, 1974-77*); both have yielded enough evidence for it (*Shaffer, 1978*). Significantly enough, a site, Kulhadeka-Johad, near Ganeshwar in the Khetri copper mine area in Rajasthan has yielded typical Harappan inverted 'V' shaped arrowheads (*Agrawal, R.C., 1978*). Obviously, Harappans had specific economic interests in several regions peripheral to their culture-area.

The fertile land between the Euphrates and Tigres was also surrounded by several neighbouring areas rich in mineral wealth with which it interacted and gave birth to a civilization whose boundaries have, however, not been defined as clearly as that of the Harappa Civilization.

Mesopotamia, like the Indus Valley, was also, by and large, devoid of basic raw materials for industrial diversification. However, the valley of twin rivers could evolve a magnificent civilization mainly because of its nearness to the hilly regions of Iran and Anatolia which were very rich in mineral resources and its ability to mobilize them. As shown above, the same situation existed in the context of the rise and growth of the Indus Civilization : the Indus Valley is located near the Baluchi and Afghan hills on the west, the Gujarat and Kathiawar hills in the south, Khetri mines in the east and forest areas in the north, regions which are equally rich in metal, mineral and forest resources. The Indus Civilization was able to evolve a trading structure by which she was able to mobilize all this wealth for its own use. Like the Indus Valley proper, Mesopotamia was mainly a land of agriculture and cattle and sheep breeding, which is clear from the list of exports: cloth, garments, wool, leather and perfumed oil (*Mallowan, 1965, pp. 1-7; Leemans, 1960, pp. 128-131*) : these were mainly the products of agricultural and pastoral activities.

II

Coming back to the question of long distance trade, the highest achievement of the south Mesopotamian cities were, as the cuneiform records and a few models and engraved depiction of boats (*Rao, 1973*) attest, the effective use of the 'Persian Gulf-cum-Makran' sea-route during the second half of the 3rd millennium B.C. (*During Caspers, 1972*), since it is doubtful if the behavioural pattern of the monsoons was known to the world before the early centuries of the Christian Era. Similar may have been the situation in regard to the Indus Civilization, although we have no deciphered written records to substantiate it in the way it has been possible in the context of Mesopotamia. However, the presence of a number of Indus seals in Mesopotamia somewhat compensates this limitation since the presence of the seals does indicate the existence of the trade. Still, it may be noted that texts are the only real basis for the history of this trade.

Regarding the long distance trade between India and Mesopotamia, two recently proposed theories have been taken into consideration since they provide a rough framework for the working process underlying the trade. The first is that of Lambberg-Karlovsky (1972, pp. 222-229), who observes that the evidences for import and export are very fragmentary. Consequently, he states, they cannot be taken as proof of direct commercial contacts between India and Mesopotamia. He employs an extension of the 'Central Place' theory in which he visualises a place located centrally between the Indus and the Euphrates where commercial negotiations, transactions, etc., took place.

A site like Tepe Yahya in south-eastern Iran may have played this role, according to him. He, therefore, visualizes a situation in which the Mesopotamian and Indus merchants met and exchanged their goods in the central place markets, and avoided going to each others' country personally. Such a situation was visualized by Bibby (1970) also in the context of Persian Gulf sites, which, according to him, also served the role of 'clearance house'.

The second theory is of During Caspers (1970, pp. 205-276) who promotes the idea of direct contacts by giving a number of evidences, particularly, the evidence of etched carnelian beads, stone seals and a number of small antiquities. She firmly believes that the goods were taken directly to the terminal markets. Intermediary stations were not important in her scheme of things although she also accepts the role of Persian Gulf States as entrepôts (1972, pp. 167-191).

III

On the face of it, the two models mentioned above appear to have over-simplified the situation, or, one may say, each one presented a lop-sided picture. Our contention is that the Harappan trade was partly direct and partly indirect because we feel that the Indo-Mesopotamian trade was mixed, it was neither completely state-controlled nor completely privately owned and it used not only the sea route but also land routes. Further, there is ample proof, literary as well as archaeological, that Indus-Mesopotamian trade was grossly imbalanced, export from Indus was much more than imports, qualitatively.

Harappan trade, according to us, by and large, appears to have been the joint-venture of merchants, agents, expert sailors, port authorities and others, since overseas

trade was a very complex affair even in Mesopotamia (*Leemans, 1960*). Mesopotamian texts clearly refer to three different designations for above mentioned individuals—Takkarum (merchant), Samallum (agent or helper of merchant) and Mari sipri (messenger employed in the trade for the transport of letters and merchandise) (*Leemans, 1960, p. 142*) (cf. *inter alia* the detailed records of the Old Assyrian trade with Anatolia). Obviously, ventures of the kind which involves these categories of people have always two major working units : (i) Production Unit, and (ii) Distribution Unit. The Production Unit is further divided into two sub-units :

- (a) the unit looking after the availability of raw materials, and
- (b) the unit looking after the manufacture of goods.

During the Harappa period, we visualise that the wealthy merchants were arranging the raw material from neighbouring regions, and organising the industry roughly on the 'factory system' (Lothal and Chanhundaro are known for their bead factories) i.e., employing several craftsmen under a single roof (*Gupta, 1978*). The head-merchant was looking after the production since this was the basis of all trade in the locally produced goods. Here one may legitimately argue that this head (merchant) may have been the ruler of the city himself and not a private wealthy merchant of the town. If so, it was the state owned unit. We would, however, beg to differ from this proposition on a very important ground : none of the seal types with a single standard inscription has ever been found in sufficiently large numbers to justify the hypothesis that there was an 'overlord' merchant.

The second is the *Distribution Unit* which has also two sub-units : (i) the unit looking after the sale of goods and (ii) the unit looking after the transportation of goods.

During the Harappan period, in all probability, on the Sumerian analogy (*Leemans, 1960*) agents of the manufacturers were looking after the first sub-unit of the major unit 'Distribution'. Possibly, these agents, had travelled to the intermediate stations for the promotion of the sale of goods. They carried only the samples or small consignments of precious items, such as the etched carnelian beads, along with them. In these entrepôts they negotiated the trade with the agents from other countries and secured firm orders from them. It was absolutely essential because the trade was based on barter system and exchange items were to be negotiated on the basis of the requirements of the home market.

The second sub-unit was the joint venture of the agents and the expert sailors. After coming back to the production centre, they could have shipped the consignments directly from some Harappan port with the help of the ship-captain and the crew after packing the goods carefully with full identification—the name of the consigner, and also the trade mark. The crew were to carry goods from one port to the other. In all likelihood, in a few selected Mesopotamian towns authorised Indian agents were permanently stationed. This can be inferred from the evidence of seals (*Agrawal, D.P., 1972, Asthana, 1975; Chakrabarti, 1978*), which is of two kinds : (a) the so-called entrepôts have rarely yielded any true Harappan seal, while (b) the big Mesopotamian cities have yielded them, albeit in restricted numbers. The presence of seals (not sealings and impressions), implies the presence of its owner who used it repeatedly. Recently Parpola *et al* (1977) have reviewed the evidence of seals in the light of some of the hitherto unpublished tablets of

Ur III period and also drawn our attention to the observations made by Hunter (1932, p. 469) on three round seals with Harappan characters found in Mesopotamia whose language must have been non-Harappan because of the marked differences in the sequence of the letters : the recently published Concordance of Harappan inscriptions (*Mahadevan*, 1977) has not a single inscription comparable to those on the above mentioned three seals.

Undoubtedly, Harappan agents stationed themselves at places like Lagash for generations together, so much so that in Ur III times, some 300 years after the Sargon of Akkad, their village was called 'Meluhha' and some of their personal names included 'Meluhha' (*Parpola et al.*, 1977). All this reminds us of the situation in which Indian place-names find their way in Indian colonies of Africa and south-east Asia (*Sircar*, 1973, pp. 33-40).

In the ultimate analysis, however, the mechanism adopted by the Distribution Unit for the sale of goods was partly indirect and partly direct.

1. Indirect—securing orders for goods on Intermediate Stations from middlemen or agents.
2. Direct—securing orders for goods directly from using agencies.

The working process of the sub-unit I of the Distribution Unit can be argued more strongly on conceptual and literary grounds than on archaeological grounds. Long distance trade invariably implies the existence of entrepôts, particularly if the entrepôts themselves have also to offer some goods for the ultimate destination. Between Meluhha and Ur there were at least two places—Magan and Dilmun—which must have served as most viable areas for entrepôts.

- (i) Mesopotamian texts are full with their description (*Leemans*, 1960) : Dilmun in the Persian Gulf (*Bibby*, 1970) and Magan on Makran (*Ib:d.*). We suggest that the port-town of Sutkagen-dor certainly played the role of 'most-briskly-used-entrepot'. The location of these entrepôts was favourable to the merchants as these were situated at very convenient points between Mesopotamia and India and the merchant or the chief of the State, in items State was controlling the trade, could have saved time, labour and hazards of journey by deputing its agents to transact business without losing any substantial gains.
- (ii) Navigation between Sutkagen-dor and the Persian Gulf islands must have been rather difficult because the coastal region along the Persian Makran was an extremely dry and desolate area absolutely inhospitable for people to settle down permanently. The hinterland sites, like Tepe Yahya, does not seem to have participated in sea-trade. May be there were a few temporary stations on the coast but we have no knowledge about them as yet (*Dales*, 1962, pp. 86-92).
- (iii) The entrepôts must have been attracting a number of agents from all directions. Here they were getting the opportunity to negotiate the trade amongst themselves. Some of the entrepôts may have also worked as 'clearing houses' for small consignments for places in the neighbouring regions, such as those on the eastern coast of Arabia, say in Abu Dhabi.

The Archaeological Evidence

- (i) Objects of unmistakably Indian origin are discovered in Bahrain island (*Bibby, 1970*) but they are not in such a large quantity as to be certain that this was the storehouse of substantial amount of goods from India or Mesopotamia. We have no Begram here.
- (ii) Cuneiform records of the 3rd millennium B.C. refer to Sumerian merchants setting out for Dilmun (from ED III time, 2600 B.C.). Some later texts mention Magan (Ur III Period, 2100-2000 B.C.). But never Meluhha, which is extremely surprising. They may have been the authorised agents with political sanction (UETV, *Oppenheim, 1954, pp. 6-17; Leemans, 1960, pp. 36-55*).
- (iii) A few circular seals (discussed later), typical of Persian Gulf seals, bearing the Indus characters have been found in Mesopotamia (*Gadd, 1932, pp. 192-210*). They are the witnesses of the Persian Gulf role in Indo-Mesopotamian trade. They possibly belonged to the local (as said earlier, their language was not Harappan at all) authorised agents who could negotiate trade transactions on behalf of the Indus merchants. A Persian Gulf seal found at Lothal (*Rao, 1963, pp. 96-99*), may, however, indicate the presence of a Persian Gulf agent at Lothal who could transact business on behalf of the Persian Gulf merchants.

Possible Interpretation

In all likelihood the State was actively engaged on behalf of the Mesopotamian traders, but whether the same situation existed in the context of Indian traders or not we do not know, mainly because the script is undeciphered. However, following facts may be noted :

1. The Meluhha trade was first mentioned by Sargon of Akkad (2370 B.C.) who boasted that boats from Dilmun, Magan and Meluhha came to the quay of Akkad (*Hirsch, 1963, pp. 37-38; Leemans, 1960, p. 164; Oppenheim, 1954, pp. 6-17*).
2. Indus finds in Mesopotamia and at Susa are meagre, their presence further down the Gulf is also limited : one lapis pendant, some stone weights from Bahrein (*Bibby, 1970*) one etched carnelian bead from Umma-a-Nar, some Indian 'style' seals from Bahrein (*Bibby, 1953, pp. 243-246*), a plain pot-sherd, with a seal impression having Indus signs from Tepe Yahya IV B (*Lamberg Karlovsky, 1971, pp. 87-96*) almost complete the list of important known objects.
3. Some Indus sealings found at Mesopotamian sites (*Gadd, 1932, pp. 191-210*) are undoubtedly to be treated as direct imports from the Indus Valley. They found their way into Mesopotamia along with the cargo shipped from the Indus harbours (*During Caspers, 1972, pp. 167-191*).
4. The seals found in Mesopotamia were certainly used by the Indus merchants or their agents as identification marks on the goods they collected in the local markets and then sent to Indus ports.
5. A seal impression from Umma (*Scheil, 1925, pp. 55-56*) is likely to have been originally attached to a package containing some kind of merchandise, probably, cotton. It was possibly sent to Mesopotamia by some Indus merchant.

IV

Now let us examine some of the important items exported from Meluhha as we have come to know from the Cuneiform records, and also determine up to what extent they were the Indian products. Gudea of Lagash gives a detailed list of objects (*Thureau-Dangin, 1925*) coming from different countries (*Oppenheim, 1954, pp. 6-17; Leemans, 1960*). Various kinds of woods, copper, gold, silver, carnelian, cotton, etc., were the important items which found their way into Mesopotamia from Meluhha. Most of the articles of these items are typically Indian.

Wood : Ur was a ship-building centre and for that hard wood was needed in huge quantity which was obtained from Magan and Meluhha. Lexical texts list three types of woods—Mes, ha-lu-ub and a-ab-ba (*Leemans, 1960, Ch. I*). Probably, hill-forests of Gujarat were providing these kinds of wood (*Rao, 1973, p. 141*), although the Himalayan sources may have provided them easily through the Indus water-course. There may have been other such forests also. Gudea sent expeditions in 2200 B.C. to Makkan and to Meluhha in search of these kinds of hard wood (teak) (*Mallowan, 1965, pp. 1-7; Leemans, 1960*), Indian teak wood was in great demand till recently (*Lallanji Gopal, 1970, pp. 108-122*) since it was most suitable in sea-water laden with salts.

Chank-shell : The shell objects have been found at Ur (*Woolley, 1934, p. 283*), Brak (*Mallowan, 1947, pp. 1*), Kish (*Watelin 1934, pp. 25-26*) and Susa. Probably, they were exported from Lothal and other Indus cities (*During Caspers, 1972, pp. 167-191; Rao 1973, p. 115*) as evidenced from the workshops producing bangles, wristlets, beads, gamesmen and diamond-shaped inlay pieces, etc. at several Indus sites, including Mohenjodaro. According to Rao, Kathiawar coast was the nearest source of chank-shell for the Sumerian cities, but certainly the Indus delta was no less rich in this material.

Ivory : It was the main product of Kathiawar and the Indus basin. Lothal (*Rao, 1973, pp. 114ff*), Mohenjodaro (*Mackay, 1938, p. 579*) and other contemporary sites, like Surkotada (*Joshi, 1972, p. 126*) are likely to have been exporting worked pieces of ivory rods, combs, inlay pieces and gamesmen to the Persian Gulf ports—Mesopotamia and, possibly, the North Syrian Coast where their occurrence has been reported in several excavations, Barabar temple (*Mortensen, 1970, p. 394*) at ‘Qala’ at al Bahrian (*Bibby, 1957, pp. 157-158*) and in the Bahrain burial tumuli (*Durand, 1880, p. 118; Bibby, 1970, pp. 32-35*) Tepe Yahya (*Lamberg-Karlovsky, 1971, p. 88*); Kish (*Mackay, 1929, pp. 1, 135*); Ubaid (*Hall & Woolley, 1927, p. 39*) Mari (*Parrot, 1968; Sheldon, 1971, pp. 12-32*).

Carnelian beads : Etched carnelian beads have been found almost on all Indus sites Mohenjodaro (*Marshall, 1931, p. 583; Mackay, 1938, pp. 505-507*) Harappa (*Vats, 1940, pp. 400-402*), Gumla (*Dani, 1971, pp. 86-88*) Amri III (*Casal, 1964, p. 155*) Kalibangan (*IAR, 1966-67*) Surkotada IC (*Joshi, 1972, p. 133*) Lothal (*Rao, 1962, p. 23*) Chanhudaro (*Mackay, 1943, pp. 199-202*) as also on some Persian Gulf and, Iranian sites, such as Shahdad (personal communications) Susa, and Mosopotamian sites such as Ur (*Woolley, 1934, pl. 133*), Kish (*Mackay, 1925, pl. X*), Al Hiba (*Hansen, 1973, pp. 62-78*), Nippur (*McCown, et al, 1967: pl. 150*) and Tell Asmar (*Frankfort, et al, 1940, pp. 204-5*). According to During Caspers (1971), Rao (1973) and Gupta (1977), Lothal and Chanhudaro were the main production-centres, as the workshops with bead-making kilns and many unfinished carnelian beads and waste have been discovered at these sites.

From the Indus region, they were exported to Mesopotamia and Susa since except India etched carnelian beads, according to available information, were not made anywhere in the contemporary world.

Cotton : The discovery of a terracotta sealing with the impression of woven fabric from Lothal (*Rao, 1973, pl. XXVI*) the actual cotton cloth piece sticking to the base of a silver vase from Mohenjodaro (*Wheeler, 1965*), a number of accessories of cotton-weavers found at Lothal and other Indus cities (*Rao, 1973*) and the seal impression with the cotton cloth from Umma (*Scheil, 1925*) indicate that cotton may have been one of the major items on the list of export items.

Cubical dice : Another object which is commercially significant is a small number of cubical dice made of terracotta, clay and bone, discovered from Ur, Tell Asmar and Tepe Gawra (*Woolley, 1955, pp. 44-79 figs. 7a-7b*) (*Frankfort, 1933, p. 48*) (*Speiser, 1935, pp. 38-47*). Dales (*1968, pp. 18-19*) suggests that the origin of this type of dice possibly lies in the Indus cities. The dice from Ur (*Woolley, 1955, p. 44, fig. 79*) is comparable with an agate dice from Mohenjodaro (*Mackay, 1938, pl. CXL, p. 63*).

Overseas trade to be economical has necessarily to follow the system of exchange-in-full. The Mesopotamian texts present ample evidence not only for imports but also exports, although none of the known texts appears to have given the exhaustive list of these items. It has been admirably discussed by Crawford (*1973*) in which she draws our attention to the Mesopotamia's invisible exports in the third millennium B.C. Fish, textiles, leather, cereals, perfumed fats and ointments have been the major items exported by Akkadian merchants, though largely between one city state and the other. As may be seen, these are all perishable items and hardly leave behind evidence to be caught by archaeologists easily, unless luck favours him or unless extremely dry or extremely cold conditions prevailed, which was hardly the case in the present context of Indus-Mesopotamian trade.

The items really required by the Harappans for their industrial needs were tin, lead and silver. It is our hunch that the Harappans got in return these items, although some luxury items, organic and inorganic both, may also have been imported. But let it be clearly stated that we do not as yet have any textual evidence for it. In fact, Meluhha is referred to in cuneiform texts in the context of imports in Mesopotamia rather than exports. Dilmun and Magan are the only two places which are repeatedly mentioned at commercial centres. It is extremely significant to mention that Meluhha's economic role, as we get the impression from the Mesopotamian texts, was important but not very important in comparison to Dilmun and Magan. It clearly shows that the role of the Meluhans may have been of a kind grossly different from those of the Dilmunites and Maganians. And herein lies the germs of our hunch, that agency system played a greater role than direct-negotiation system. Recovery of only stray Harappan seals with Harappan and non-Harappan languages also favours only this kind of mechanism.

V

The recovery of sixty-five terracotta sealings, some of them bearing the impressions of packing material on the other side, from the warehouse of Lothal (*Rao, 1973, p. 119*) leaves no doubt in accepting the suggestion that the Indus seals were the commercial tools used for sealing the cargo. After packing the goods properly, the consigner's seals

were affixed on the labels of wet clay at the knot (Rao, 1973). On the basis of two to three impressions of different seals on a few clay sealings recovered from the Lothal warehouse (one found at Kalibangan also : Lal, 1973), Rao proposes the theory of 'profit sharing partnership', i.e., the parties in trade and the warehouse authorities stamped the cargo jointly with their own marks for purposes of authority and identification. We feel that the Indus seals in India belonged to merchants, port-authorities and ship-captains, although in the absence of the deciphered script it cannot conclusively be proved. At the present state of our knowledge we are unable to visualize if these people were sharing the profit of trade or not. The seals found at the hinterland sites also seem to have belonged to merchants and not to political authorities. The belief is based on the fact, as said earlier, that no single standard type of seal bearing a single motif and single inscription has been found repeatedly at one or several sites.

Square Seals : at Tello (Thureau-Dangin, 1925, pp. 99-101), Umma (Scheil, 1925, pp. 55-56) and Kish (Mackay, 1925, pp. 697-701) a small group of square steatite seals have been found which are identical in shape and character to the Indus seals. They consist of the button boss at the back and the figure of unicorn standing in front of an object typical of Indus motifs and the Harappan legend on the front. The sequence of characters tally with those found on Indus seals in India.

An alabaster seal comes from Tell Asmar which shows concentric squares with a bead pattern in between and a cylindrical knob at the back (Frankfort, 1933, Fig. 32). Tepe Gawra (Speiser, 1935, p. 82 pl. XXXI-b) has also yielded a terracotta stamp seal with concentric squares but without a bead pattern; Mohenjodaro and Harappa have produced similar stamp-seals (Marshall, 1931, C. IXV, no. 516; Vats 1940, XIV, No. 383). Recently, a stone rectangular seal imported from some Harappan site with bull and an inscription has been found at Nippur (Gibson, 1977).

A small square seal with a Swastika design has been found at Kish in Mesopotamia (Mackay, 1931, p. 465) and Altin Depe in south Turkmenia (Masson, 1972). The swastika was commonly depicted by the Harappans and appears to be a typical Harappan motif. A plain seal with Harappan characters has also been found at Altin Depe (personal communication).

Round Seals: Gadd (1932, pp. 191-210) has listed 18 seals of the so-called Indus type found at Ur and in Babylon. Among them five seals are round with the button boss at the back giving the look of Persian Gulf seals with typical Indus characters. Identical seals have been acquired from Mohenjodaro and Chanhudaro (Marshall, 1931, pp. 30, 3383, 478; Mackay, 1938, No. 500; 1935-36). Rao (1970) feels that these seals belong to the Indus merchants living in Bahrein. According to Mackay (1938, p. 343), these seals were imported into Sumer from some Indus site, other than Mohenjodaro and Harappa. We agree with During Caspers (1972) when she says that their shape might have been influenced by some commercial consideration, such as the adoption of the style of the region where the parties negotiated the trade.

A few seals share Indian as well as Mesopotamian characteristics. For example Seal No. 1 of Gadd's list (1932) is squarish with a perforated button on the ridged back and the Indus bull with the archaic Cuneiform legend on the front. Gadd (1932) and Rao (1973, p. 121) are of the opinion that this seal appears to be the product of a place which was under both Indian and Sumerian influences, and was, perhaps commissioned by an Indian merchant settled at Ur. To us, it appears that it belongs to some

ship-captain working at both the ends for merchants, possibly as an authorised agent. The same can be applied to two cylinder seals with Indus motifs from Ur (*Gadd, 1932, Nos. 6-7*) : the No. 7 cylinder seal with typical Sumerian shape and Indus motif of poor workmanship has some characteristics (foot-print) of the Dilmun glyptic art (*During Caspers, 1972*). We think that these examples of cross-breeding go a long way to substantiate our hypothesis of operative system of trade based on an agency system.

A glazed steatite cylinder seal, showing the procession of an elephant, a rhinoceros and a crocodile, has been discovered at Tell Asmar (*Frankfort 1933, pp. 50-53*) in the cluster of Indian objects. Though the fauna is typically Indian, yet the inferior treatment of the animals indicates the non-Harappan (local) origin of the seal. During Caspers (*1972*) believes that it was copied in Elam. Be that as it may, the crucial point is to understand the underlying factors which were responsible for such products. Here also we see the same factor : the prevalence of the agency system.

Parpola *et al* (*1975*) have argued in favour of the process of acculturation of the Meluhhans in Mesopotamia. It is an all-pervading process in which all aspects of culture of a people pass through several stages of change. In time, the old features get either lost or transformed into the new ones. The determining factors remain those which belong to the higher culture or culture in which the smaller group of people find itself in hopeless minority. Thus, although in the Akkadian times 'Meluhha' and 'Meluhhans' referred to a foreign land and foreign people, requiring even interpreters to translate the Meluhhan language, in Ur III times, while Meluhhans still remained as a distinct ethnic group, they became completely natives and participated in all cultural and commercial activities in that capacity. Parsis in India present the closest modern analogy. The above details fall in the framework we are visualizing here : stationing of a small number of Indus agents in Mesopotamian towns.

Mesopotamian Seals in Indus Valley : The discovery of a few seals in India showing Mesopotamian influence clearly demonstrates the two-way traffic of the trade. The cylinder seals found at the Indus sites may therefore also be interpreted as the proof of the stationing of the Mesopotamian agents in India.

Two seals from Mohenjodaro depict animals, probably, antelopes (*Mackay, 1938 Seal No. 376; Marshall 1931*). Since antelopes occur frequently on the Sumerian and Elamite seals, it can easily be inferred that it was the adoption of a popular West Asian motif. Five cubical seals of sandy yellow paste have been discovered at Mohenjodaro and four of them bear parallel lines, crossing one another on two opposite sides. This design was quite popular in Mohenjodaro (*Marshall, 1931*) and Susa (*Delaporte, 1920*).

It is equally significant to note that eight seals of the Indus Valley depict buffalo-heads in typical Sumerian style, showing both the rugged horns well developed (*Mackay, 1938, pp. 330, Nos. 257, 279, 342, 443, 570, 587, 663, 696*). A number of Mohenjodaro seals (*Mackay, 1938, pl. LXXXIV, pp. 75-76; pl. LXXXV, p. 122; pl. XCV, p. 454*) depict a man struggling between two animals presumably tigers. Undoubtedly this scene reflects the Sumerian influence or Elamite influence.

VI

The second important tool of the Indus trade was the stone weight which is distinct

from the West Asian weights in shape, standard and material. The Harappans used hexahedron, popularly known as cubical, weights of chert and agate adhering to a pre-determined standard. These were adopted throughout the Indus culture-area (*Rao, 1973*). On the other hand, Egyptians and Sumerians used barrel or duck shaped weights of alabaster. Cubical chert weights, discovered at Kish, recall their parallels from Harappan sites. According to Rao (1973), the Lothal merchants may have used the Indus standard for trade 'within the Empire' and an additional standard for international trade. At a later date we find similar standard being used by the Assyrians; of course, only indirectly.

Due to the hostile behaviour of Elam towards Mesopotamia, occasionally, as evidenced from the cuneiform records (*Kramer, 1952*), the sea-route was discovered and put into traffic in spite of difficult and risky navigation (*Leemans, 1960*) ; Lothal dockyard with five stone-anchors (*Rao, 1973, p. 125 Fig. 31*); terracotta models of boat from Lothal (*Rao, 1973, p. 124*); engraving of a boat on a seal from Mohenjodaro (*Mackay, 1938, pl. IXXXIX A*); representations of sailing ships and boats on some Mohenjodaro seals (*Mackay, 1938, LXIX, 4*) and on Lothal potsherds (*Rao, 1973, p. 124*), as also on a terracotta amulet from Mohenjodaro (*Dales, 1965, p. 143*), all attest the existence of the sea-journey. The evidence also attests the types of ancient sea-crafts of which three types are distinguishable from the Lothal models—two types of sharp-keeled boats with provision for the mast must have sailed on the high seas, whereas the third type resembling canoes was used in the estuary only (*Rao, 1965, 1973*).

It is, therefore, more than probable that the Mesopotamians and Harappans established a maritime power with a strong commercial fleet of ships and with a number of trading stations at selected points along the coast to enable the ships to prepare for the onward journey. Sargon of Akkad clearly mentions the arrival of Meluhhan ships in the bay at Akkad. And he feels proud of it (*Leemans, 1960*). Obviously, some ships loaded with goods sailed directly up to the coast of Mesopotamia. It is our hunch that these ships carried very heavy items, such as the teak wood required for ship-building by the Mesopotamians. The situation continued throughout the 3rd, 2nd and 1st millennium B.C. Gudea also got wood and other raw materials for his temples from Meluhha. Later on also Indian timber was required. The ships containing smaller items may have travelled only as far as Magan or Dilmun, that is at ports between Sutkagendor and Bahrein or Failaka islands.

Sutkagendor on the river Dasht, Sotka-Koh near Pashni, in the Shadi Kaur Valley, and Balakot near Sonmiani were built on the strategic points to control the communication. In this context, it is extremely significant to note that the small site of Allahdino, within the metropolitan city of Karachi, has yielded an unusually large number of copper implements, more than a hundred, and also earthen pots while no evidence of factories and kilns have as yet been found in or near the habitation (*Shaffer, 1977*). Undoubtedly the site was meant for redistributional activities. It is possible that the ports, located as far west as Sutkagendor, were controlled and manned exclusively by the Indus people while more westerly ports were looked after by the Persian Gulf people and also the Mesopotamians with some understanding on the distribution of ports between themselves, of which, of course, we have as yet no definite proof. However, there is one very interesting reference (*Kramer, 1952*). The king Rimush of third millennium B.C. is said to have conquered Meluhha. What could be the underlying reasons for this military

expedition beyond Magan? Not for territorial gains is obvious from the circumstances, particularly space. Undoubtedly, for giving protection to commercial interests of the Mesopotamians. Fortification of the port-towns like Sutkagendor is, therefore, meaningful : some kind of apprehension of military attack may have been there.

Lothal, Surkotada, Allahdino, Mohenjodaro, Chanhudaro, Balakot and Harappa were some of the main commercial towns of the Indus people during the third millennium B.C. The sea-route through which their goods went to Mesopotamia seems to have started from the Gulf of Cambay and then passed along the coast of the Arabian Sea, entered into the Persian Gulf and finally reached the mouth of the Euphrates near Ur.

As said earlier, Akkadian documents refer to the lands called Dilmun, Magan and Meluhha, sometimes separately, sometimes together. They were situated eastward and were the source of raw-materials and also finished goods (U.E.T.V. *Leemans*, 1960; *Oppenheim*, 1954). A number of attempts have been made to identify the lands of Dilmun, Magan and Meluhha (*Albright* 1925; *Cornwall*, 1946; *Leemans*, 1960; *Landsbarger*, 1964-66; *Gelb*, 1970; *Dales*, 1971; *Bibby*, 1970; *Hansman*, 1973; *Thapar*, 1975). It is now generally believed that Dilmun was located somewhere in the Persian Gulf : Bahrein or Tanit or Failaka, or else the term was used for this whole region (*Bibby*, 1970, pp. 349-350; *Glob*, 1958). This must have been an intermediary market for settling the trade and not the original source of goods. There are no local resources except for fish and pearls. Magan and Meluhha come next, just after Dilmun, in the texts. Generally, Magan is identified either with the region of Oman or south-eastern Iran and Makran. *Leemans* (1960) identifies Meluhha with western India while *Oppenheim* (1954) identifies it with the Indus region. Romila Thapar (1975) identifies it with Gujarat. Eventually, whatever may turn out to be the correct identification, Meluhha appears to have been the generalized term for the Indus culture-area although it may have been at times applied specifically to the Indus deltaic region to which the Himalayan timber required by the Mesopotamians so pressingly flowed down for onwards journey.

It is significant to note that after the Akkadian period, first Meluhha lost its place of great prestige in Sumerian merchantile records, and after a shortwhile Magan met with the same fate, although in either case they never completely ceased to be mentioned. Thus, although Dilmun was the only market which remained open for the Sumerians, the products of Magan and Meluhha were still reaching Mesopotamia, albeit in restricted quantity, both through the intermediate markets and directly as earlier times. This can easily be made out from the Indus seals found in the Isin-Larsa and Kassite houses, and Mesopotamian texts of Ur III period.

VIII

The above survey, while attesting the existence of a good amount of trade between India and Mesopotamia, rules out the existence of Sumerian *colonies* as such in India or Harappan *colonies* in Mesopotamia. It favours, however, the stationing of agents of the Indus merchants in Mesopotamia and also the agents of the Mesopotamian merchants in the Indus area. The number of people involved, therefore, must have been very small, although almost permanently settled, even in chain-like manner.

It may again be emphasized that the quantum of direct trade at any particular time appears to have been somewhat limited since the available seals belong to different

periods, the only exception being the Akkadian period during which it appears to be substantial enough to have been incorporated in the inscriptions. The same can also be surmised from the fact that had there been really regular colonies, the influence of one culture over the other must have reflected much more in their material and moral cultures. But as the merchants may have been going, by and large, only up to the port, or entrepots with the consignment, and only a few individuals were stationed as authorised agents in major towns, both the civilizations remained practically uninfluenced by each other. However, from Ur III times the agency system of trade seems to have collapsed and Mesopotamians looked more towards Arabian and African markets than to Magan and Meluhha. Slowly and gradually the process of acculturation de-Harappanized the agents and made them part and parcel of the native culture-group.

It, however, appears that because the agents were already familiar with the markets, the political changes did not bring about complete stoppage to the overall character of the trade. Navigation still continued to enable the goods to be transferred to the entrepots as well as to the capital cities. It is doubtful if the heads of the merchant houses themselves ever became the main tool of the trade, although occasionally they may have journeyed. It is our hunch that had the chief merchants themselves gone, controlled the trade and resided in each others' country long and bilingual inscriptions would have resulted. As a corollary, since only a few seals with Harappan characters have been found, the man authorised to use it must have been allowed to work only within a tight jacket—that of an agent. Hybrid seals also go a long way to establish this hypothesis.

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1

The Harappa Culture in Gujarat

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SUMAN PANDYA

THE MATURE phase of the Harappa Culture in Gujarat differed significantly from that of the nuclear region. In Gujarat it was composite in nature incorporating a number of indigenous elements. Secondly, even the Harappan tradition witnessed some regional modifications. The local (regional) traits appeared right from the earliest phases and continued along with the Harappan ones. However, at the end of the Harappa Culture the local elements predominate. From the Saurashtra Harappan is documented the Micaceous Red Ware, the hand-made coarse Grey Ware and the Black-and-Red Ware. They were associated with short blades of jasper and chalcedony.

Kutch witnessed different developments. At Surkotada Period IA produced the Red-slipped Polychrome Ware, the Polytone Cream-slipped Ware and the Coarse Red Ware along with the typical Harappan artifacts. Later on, in Period IB, the Coarse Red Ware and chalcedony blades increased in quantity. The change was drastic in Period IC; its main ceramic types were Coarse Red Ware and Black-and-Red Ware. Of course, the Harappan traits were still associated with them. Surface collections from most of the sites in Kutch showed the Harappan assemblage associated with Coarse Red Ware, Black-and-Red Ware, and blades, cores and flakes of chalcedony. Stone masonry and *Linga*-like unbaked clay objects are the other characteristic features of the Kutch Harappan.

The typical Harappan features such as seals and sealings, script, Red Ware and Buff Ware painted in the Harappan style, chess-board town planning, cubical weights, long parallel-sided chert blades, sanitary arrangements, beads of semi-precious stone, terracotta toy carts, bird whistles, triangular cakes etc., copper tools, weapons and ornaments are documented at quite a few sites. Most of the other sites yielded Harappan Red Ware, Buff Ware and a few copper objects.

The Harappans appear to have chosen suitable ecological niches where adequate resources were available for agriculture and animal husbandry.

Gujarat may be divided into four main ecological zones *i.e.*, Saurashtra, Kutch, south Gujarat and north Gujarat. The former two zones were widely occupied by the Harappans and come under the semi-arid tract.

Deccan lava forms the main core of Saurashtra region. Medium black soil dominates, which is good for agriculture. In the central part, the soil cover is thin but towards the coast its thickness increases. The coastal plains are formed of alluvium of different formations. The rivers radiate in all directions providing rich soil and water resources for agriculture. The region is served by the southwest monsoon with about 700 m.m. annual rainfall. However, the rainfall is patchy and scattered. The coastal Gujarat is also composed of alluvial soil like Saurashtra. Here annual rainfall varies from 800 m.m. to 1000 m.m. River strips with alluvium are fertile.

Deccan lava and Jurassic limestone are bedrocks of Kutch. Medium black soil is confined here to the central area only. The rest of it is sandy alluvium like north Saurashtra. Kutch also falls in the arid zone. Annual rainfall is only 400 m.m. This helps to grow only grass to feed the cattle.

The extensive sea coast of Gujarat was in contact with the neighbours since very early times. Kutch, however, is connected with Sind by land route.

Most of the sites in Gujarat were small to medium sized settlements. They were generally located near the water resources on the medium black or alluvial soil. The culture assemblage encountered indicated their village economy dependent on agriculture, animal husbandry, fishing and cottage crafts. The available resources were enough to support prosperous villages. Except the fertile *Bhal* area the region could not produce enough surplus food to give rise to large scale urban development. It was probably a non-urban (not to be confused with the post-urban phase) aspect of the same culture.

The Gujarat Harappan may be divided into two regional groups: The Saurashtra Harappan including coastal Gujarat and the Kutch Harappan. Even before the arrival of the Harappans, the former had indigenous cultures flourishing in the region. Kutch, particularly Surkotada, has some indigenous elements which are common with the pre-Harappan Kalibangan (KLB-I) and Kot Diji.

At the downfall of the Harappan culture Kutch was influenced by the Banas culture; through Saurashtra some new traits entered the peninsula. Here without any stratigraphical break the Harappan culture was modified into a regional culture known as the Lustrous Red Ware culture.

Saurashtra Harappan

The peninsula is full of a large number of Harappan sites, showing mixed traits. Coastal south Gujarat sites seem to have a close relationship with the peninsula. Culturally they may be correlated to the late phase of Lothal, and Rangpur Period IIB, IIC.

So far the maximum evidence comes from Lothal, Rangpur, Shrinathgarh and Bhagatrav. The surface evidence from a couple of sites yielded the Harappan Red Ware, the Buff Ware, rare chert blades, all associated with some indigenous elements. A few sites also had mud brick structures and the typical Harappan ceramic forms with the painted designs. Hajnali, Buikotada and Budhel might be enlisted as Mature Harappan sites. Now we will deal with the excavated sites first and then the surface collections.

Lothal

It is located 80 kms. south of Ahmedabad in Dholka taluka of Ahmedabad district.

The excavations conducted by S.R. Rao have revealed two main periods. On the structural evidences they were divided into five phases. The whole sequence is as below:

Period I A	Pre-Harappan; Micaceous Red Ware culture
Period II A	Mature Harappan
Period III A	Mature Harappan
Period IV A	Devolved
Period V B	Evolved culture

Most of the evidence for the Gujarat Harappan comes from the Periods II and III A. As there is little to distinguish between these two phases, they might be bracketed together as one.

The town of Lothal had a typical chess-board planning. The whole complex was divided into two: citadel (acropolis) and the residential area (lower town). The whole town was built over mud brick platforms separated by lanes and bylanes, with widths measuring 4 to 6 m. and 2 to 4 m. respectively, cutting each other at right angles. Average area of a house was 59 sq.m. and it had rooms, kitchen and a veranda in front. Mud brick walls were plastered with mud or lime and were rather too thick—1 to $1\frac{1}{4}$ m. Floors were paved with mud bricks, terracotta balls or pellets. However, if Lothal was subjected to frequent floodings these floors should have been wiped out. Both the areas documented drains and baths. Lower town was occupied by craftsmen with their workshops and the market.

The acropolis was built over 4 m. high mud brick platform. It consisted of some residential houses with drains and baths. A nearby granary occupying an area of 14 sq.m. stood over a mud brick platform measuring $48.5 \times 42.5 \times 3.5$ m. Divided into twelve cubical blocks of sundried bricks, it had some channels cutting at right angles. The 'dockyard' was very close to this complex. The 'dockyard' measuring $214 \times 37 \times 4.5$ m formed an enclosed basin with 'spillways' and inlets at its sides. Its identification as a 'dockyard' has been questioned by scholars.

Most of the ceramic fabrics including the Reserved slip ware were present at Lothal. Goblets, beakers, perforated jars, perforated handled cups, typically painted S-profile jars and miniature pots were also evident. The typical Harappan painted designs such as pipal leaves, flowers, honeycombs, checkers and triangles are also met with at Lothal. However, some new regional designs such as stag standing below a tree, peacock with spread plummage standing on horizontal bands, a pair of highly naturalistic cranes and palm tree were also documented.

Lothal also produced cubical weights of chert and agate: terracotta triangular cakes; a good number of seals and sealings inscribed with animal motifs and the script; shell and ivory inlays; terracotta toy carts with wheels and frames; and chert blades and beads. The cultural assemblage also included some significant copper objects such as celt, axes, drills, fish-hooks, needles with eyelets, razors and knives. The copper technology was further highlighted by the presence of dog, hare, an amulet with a bull figure and a pin with a bird head. The metal was also used for ornaments i.e. earrings, finger rings and bangles. Coppersmith's workshop slag and furnace indicate local manufacture of metal objects. Casting was done in simple open mould. A fragment of a drill with twisted grooves and curved saw suggested advanced technology.



In Phase II and III of Period A, Lothal had maritime trade relations. Its location near the head of the Gulf of Cambay and its urban character with workshops of ivory, shell and beads; seal and sealings, and copper ingots may support such an assumption. Since the early historical period the ports located on the Gulf were engaged in exporting beads of semi-precious stones, hides, grains, onions, silk etc. Maritime trade with the Persian Gulf countries, the coast of Makran, Pakistan and South India are still carried out in native small ships. Maritime trade relation of Gujarat with the Persian Gulf countries and even upto east Africa has a long history.

Possehl has, however, doubted the maritime trade relations of Lothal with the Persian Gulf countries. His view is that the occurrence of the Indus objects at the Mesopotamian sites and the mention of 'Makkan' and 'Meluhha' in the Mesopotamian texts do not reveal any exact location. The 'dockyard's' functional identification is doubtful and the Persian Gulf seal is a surface find and therefore does not have much value. Apart from these there is hardly any evidence to support the idea of Lothal's maritime activities. On the other hand, the presence of evidence of hunters/food gatherers in north Gujarat may indicate that Lothal was engaged in a commercial relationship with the nomads of north Gujarat on the one hand and agricultural villages of the Harappans on the other. The large bulk of finished products was transported to the central places of Sind by land and marine routes.

Despite Possehl's views to the contrary, I think that the overall picture of the cultural assemblage and its location suggests that Lothal could have maritime trade relations outside the Gulf of Cambay, most probably with the Persian Gulf countries even without any dockyard. During high tide ships can be loaded and unloaded in the creeks. Even today this is a common practice in Gujarat. Its prosperity, as Possehl contends was not merely dependent on the food gatherer of north Gujarat but on the surplus food production of the fertile *Bhal* and on the easily available resources of the raw materials for their export industries. A nearby creek which probably provided facilities for marine trade played a key role in its urban development.

Rao has suggested that frequent floods were the cause of Lothal's downfall. But I think that receding of the sea and silting up of the creek were the main reasons of the economic downfall of the town. We have an exact parallel in historical times of Vallabhipur, the Maitraka capital. Lothal gradually shrank in size and lost its urban identity. Rao has repeatedly tried to emphasize the significance of Lothal. This has led to exaggeration of, and over emphasis on, 'dockyard', 'anchors', small terracotta boats and its maritime trade activities ; frequent flood devastation; handling of the problems related to floods; and the probable administration for the urban development. This led some scholars to undervalue the significance of Lothal. However, we find that most of the evidences confirmed its significance in Harappan culture as an urban port town.

Rangpur

The site derives its name from the village Rangpur situated on the northwestern edge of the mound. It is situated on the left bank of the river Sukhadar, 6 kms. northwest of Dhandhuka railway station in Limbdi taluka of Surendranagar district. The site lies 46 km. southwest of Lothal. Rangpur was subjected to excavations thrice.

The last excavations conducted by S.R. Rao have revealed the following sequence:

Period I	Pre-Pottery
Period IIA	Mature Harappan
Period IIB	Mature Harappan
Period IIC	Modified Harappan
Period III	Evolved; lustrous Red Ware Culture.

Nearly 2.5 m thick cultural deposit of Period IIA of Rangpur has a Harappan affiliation.

The houses were constructed over mud brick platforms and had mud brick paved floors. Drains and baths were also noticed. Mud bricks maintained the Harappan size ratio: 1 : 2 : 3. However, the presence of post-holes in the mud walls indicate unsophisticated dwellings. ?

The presence of cubical weights ; chert blades ; bird whistles ; toy carts; cylindrical carnelian and banded agate beads; disk beads of gold and steatite ; terracotta cakes ; copper object ornaments etc. confirmed the Harappan affiliation of Rangpur. Some potsherds were inscribed.

The Harappan ceramic forms appeared were with the indigenous micaceous Red Ware and Black-and-Red Ware. However, the typical Harappan form, such as beakers and goblets were very limited. Even the typical Harappan motifs were rare. Later on the culture was modified and has been discussed elsewhere in this volume.

Rangpur has offered significant ceramic evidence to show the continuity of the Harappan Red Ware and the Lustrous Harappan Red Ware. However, Misra and Possehl seem to be strong critics of Rao's Rangpur excavations. Possehl writes:

"Rangpur is far from an ideal site. . . First, the periodization at the site is based almost exclusively on pottery. Neither small finds, nor radiocarbon determinations are present to support the ceramic sequence. The report itself is at times confusing and contradictory. Even the routine interpretation of physical stratigraphy has been a subject of debate. The interpretation of stratigraphy offered by Rao is presented in figure 14. It is not fully apparent from this diagram; however, it is abundantly clear in the text—the stratigraphy is completely reconstructed and at no point has an excavation trench placed so as to bring sub-Period IIA and IIB into unquestionable stratigraphic association. Rao has, therefore, offered a developmental study of the ceramics. In these areas his work is reasonable, however, the general situation is lamentable.

Something more specific concerning the final report on Rangpur must be said before addressing the chronology problem. When reading Rao's report on Rangpur, it is essential to remember that before it was written Rao had already several seasons of excavations at Lothal, a much more productive site. It is apparent that the many of the statements given in the Rangpur report and supposedly meant by Rao to apply to that site have their substantiation only at Lothal. Rao is not careful to note this. . . The report remains one of the poorest in overall quality.

The available picture of Rangpur indicates that it could be a medium sized village and had a different development than the other urban centres. It was probably contemporary to the middle and late phases of Lothal Period A.

Shrinathgarh (Rojdi)

The site is situated about 2 km. west of the present village of Shrinathgarh (former Rojdi). It is situated on the left bank of the river Bhadar, about 21 km. southwest from Gondal; 50 km. south of Rajkot in Gondal taluka of Rajkot district.

The mound was excavated twice. First it was excavated by the late P.P. Pandya, later on the excavations were renewed by the state archaeology department under Shri J.M. Nanavati. The excavations revealed three periods and two sub-periods of Period I.

Period IA	Harappan
Period IB	Modified
Period II	Early historical
Period III	Medieval

Here, at Shrinathgarh Period IA and IB were marked by some of the Harappan traditions. Cubical weights of chert and agate; etched beads of carnelian; beads of terracotta, banded agate and faience; copper objects; ornaments; gamesmen and inscribed potsherds were encountered.

Mud brick platforms and drains were encountered in Period IA; later on they disappeared.

The ceramic industries of Period IA comprised the Harappan Red Ware, and the Buff Ware associated with a local Coarse Grey Ware and the Micaceous Red Ware. A few sherds of the Reserved slip ware were also encountered. Painted designs were mostly geometric and consisted of hatched diamonds and triangles, wavy lines, pellets etc. Fish and leaves also appeared as decoration.

Period IB was marked by modification. The typical Harappan wares except the Red Ware, disappeared. New ceramic industries, *i.e.* the Prabhas Ware and the Lustrous Red Ware appeared. However, two earlier local traits—the Micaceous Red Ware and the Coarse Grey Ware—continued to occur.

Later on the mound was occupied in historical periods.

Bhagatrv

This site is located in coastal Gujarat, at the mouth of the river Kim. It has yielded the Harappan Red Ware and Buff Ware in Period I. Dish-on-stand, storage jars, dishes and bowls were main forms. Parallel-sided chert blades; disc beads of steatite; biconical beads of carnelian and steatite; a terracotta bull figurine; and some unidentified copper objects formed part of the Harappan assemblage at the site.

As the excavation was on a small scale, Bhagatrv did not offer a clear picture of the settlement. Available evidence so far does not unequivocally put it under the Mature Harappan, nor was there any urban development at the site. However, its location seemed to be very significant indicating its maritime relationship.

Other Sites

Most of the other sites in Saurashtra produced the Red Ware and the Buff Ware,

along with the indigenous wares and chalcedony blades. The cultural assemblage reported from Pithadia (Rajkot dist.), Lakhabaval, Amra (both in Jamnagar dist.) and Somnath (Junagadh dist.) etc. did not show the typical Harappan traits. The ceramic forms were restricted to dish-on-stands, dishes, bowls and perforated jars. Painted designs were rare and mainly comprised bands etc.

It seemed that when the Harappa culture reached Saurashtra either it was diluted or the region witnessed a rural phase of the culture with only a few small urban centres. These urban centres documented most of the Harappan traits specified by Wheeler.

Kutch Harappan

Kutch was geographically closer to the nuclear Harappan region showing stronger ties with Sind rather than Saurashtra. The mature phase in Kutch was documented at a few sites, but at present most of the evidence comes from Surkotada Period IA and Deshalpur Period IA. Like Saurashtra, Kutch also showed a composite assemblage with both the Harappan and the non-Harappan elements. The Harappan was dominated in mature phase. Later on, after the decline of the Harappa culture, Kutch was influenced by the Black-and-Red Ware culture. Absolute absence of the Lustrous Red Ware culture in Kutch is very significant indicating a stronger influence of Rajasthan rather than of Saurashtra. Fortification around the citadel and the residential areas at Surkotada and some other sites indicate the strategic position of Kutch as it was the route of migrations and invasions from Sind.

Surkotada

The ancient habitation of Surkotada is in Bhuj (Kutch) district. It is nearly 12 kms northeast of Adesar and 160 kms northeast of Bhuj. It was explored and excavated by Jagat Pati Joshi. The mound measured $160 \times 125 \times 5$ to 8 m. The cultural sequence is as below:

Period IA	Mature Harappan having three structural phases
Period IB	Modified Harappan having three structural phases
Period IC	Modified Harappan also having three structural phases

The sequence at the citadel and the residential area were the same.

The town was divided into two complexes: the citadel and the residential area. They were enclosed with ramparts. The rampart was built with mud bricks of the Harappan ratio 1 : 2 : 3 ($10 \times 20 \times 30$ cm.). At a later stage at the river side buttresses of mud brick with a rubble facing were added. It had two entrances located at the southern and eastern sides. In the residential area the rampart was less thick. A gate was provided at the south western corner for communication with the citadel.

During excavation no complete house plan was exposed. However, Period IA had the

Harappan system of drains and baths. Rubble masonry was used in house construction—a unique feature of the Kutch Harappan.

The ceramic evidence was of a mixed nature. The Red Ware occurred in profusion with its typical forms: goblets, beakers, cups with perforated handle; S-profile jars, dish-on-stands and perforated jars. Sun, pipal leaf, fish and fish-scale, latticed bands and peacock motifs were akin to Mohenjodaro. The Reserved Slip Ware was documented by globular bottles with holed mouth, concave necked vases, dish-on-stands and basins with incurved rim. Horizontal bands, and wavy lines appeared as a decoration. The ware showed stronger affinity with the urban centres of Sind. So far in Gujarat only Surkotada has given the richest collection of the Reserved Slip Ware. The Harappan ceramics were associated with the Polychrome and the Polytone cream slipped ware was akin to Kalibangan I and Kot Diji. Mughal has therefore rightly suggested the spread of pre-Harappan culture of Sind in Kutch.

The other discovered artifacts were cubical weights of chert, steatite seals with the script and unicorn terracotta cart wheels and frames, triangular cakes, balls and bangles etc. The assemblage also included chert blades, beads of steatite, lapis lazuli carnelian and faience and copper objects. *Linga*-like objects of unbaked clay seemed to be a unique feature of Surkotada.

Two burial rites—pot burial of the decomposed body and empty graves with some pots—differed from the usual Harappan practice and probably they belonged to late periods.

In Period IB some ceramic traditions seemed to continue, yet a great change was evident in the culture. The Mature phase of the culture came to an end; however, some of the traditions lingered on in a modified form in the post-Harappan culture.

Deshalpur

The site is located near Gunthali in Nakhatrana taluka, Bhuj district. A small scale excavation was carried out by K.V. Saundara Rajan. The excavations revealed two cultural periods.

Period IA	Mature Harappan
Period IB	Modified Harappan
Period II	Early historical assemblage akin to the Rang-Mahal culture of Rajasthan

Period IA at the site seemed to be Mature Harappan. The town had a fortification built with dressed stones with mud brick filling inside. Towers and salients at the corners and a probable gate at the eastern side were also encountered.

Mud bricks were of the Harappan standard; 1 : 2 : 3. Within the fortification wall the houses were built, quite often just against the walls. In the central part there was a building complex with its massive walls with regular foundations, offsets, rooms; obviously it must have some special significance.

All the main ceramic industries were present here in Period IA. But the typical shapes were limited. Painted designs were simple marked by horizontal bands, rows of alternative chequered oblongs and honeycomb etc. In Period IB, like Surkotada, a modification

of the culture was noticed. In the absence of C-14 determinations, Period IA might be culturally equated with Surkotada Period IA.

The following sites were explored but not excavated.

Kotadi near Dholavira is located in Kadir, an island off the greater Rann of Kutch. It measured nearly 315 sq. m having a citadel and residential area. Surface find included an Indus seal, ceramic industries, the Reserved Slip Ware, chert blades, terracotta Cart Wheels, triangular cakes, balls and copper objects. Some other ceramic forms were akin to Kalibangan I and Surkotada Period IA. Chalcedony blades were also found. Kotadi is a promising site worth excavation.

Kotada near Juni Koran also had a citadel and a fortification and of course yielded Harappan artifacts. Most of the other sites were composite in nature combining the Harappan and the non-Harappan traits. The non-Harappan elements were marked by a Black-and-Red Ware and Coarse Grey Ware similar to Surkotada Period IB and Period IC along with blades of chalcedony and semi precious stones etc. As none of these sites have been excavated so far it can probably only be guessed that the earlier periods might belong to the Mature Harappan phase.



The Nature of Settlement at Surkotada

6

JAGAT PATI JOSHI

THE EXCAVATIONS at Surkotada have been rewarding in unfolding a sequence of three Cultural sub-periods *i.e.*, IA, IB and IC, mostly based on ceramic evidence and well within the span of Harappan Chronology *i.e.*, *circa* 2100 B.C. to *circa* 1750 B.C. The site has yielded the evidence of successive settlements in three sub-periods having broadly a similar pattern of settlement consisting of a citadel in the west and an adjoining residential annexe in the east in an area of 120×60 m.

Period IA

A. (1) *Selection of the Site* : Deep digging in selected areas of the mound revealed that the Harappans on their first arrival at Surkotada discovered that the western side of the site was 1.50 m. higher than the eastern one. Perhaps, taking advantage of the available natural contour, the higher side was found more suitable to build a citadel while the residential annexe was preferred in the lower side. Besides, the adjoining *nala* emanating from the nearby catchment area in the southern side of the mound and availability of sufficient land for cultivation of food grains in the neighbourhood were considered to be the major attractions to the new comers to settle down.

(2) *Raising of the Ground* : The Harappans who were very much 'platform minded' made the ground uniform by raising it to an average height of 1 to 1.50 m. in the citadel area and 0.50 m. in the residential annexe by putting very hard yellow rammed earth to serve as a secure and uniform base for their future structural activity.

(3) *The Citadel* : The exact dimensions of the citadel in sub-period IA could not be determined as the citadel rampart could be exposed partially only in the eastern, southern and western sides. The area of the citadel from east to west is 60 m. But on the analogy of the later rampart of Period IC the area of the citadel might not be much different in sub-period IA as similar pattern has been followed *i.e.*, 60×60 m.

(4) *The Ramparts* : The rampart of the citadel has been built over a hard yellow rammed earth and it could be partially exposed in the western, southern and eastern sides. In the western side it has been exposed up to a length of 9.60 m. and is available to a height of 1.10 m. It is made of mud bricks (size $10 \times 20 \times 40$ cm.) and

laid in mud mortar in English bond. In the southern side, just near the entrance, vestiges of Harappan rampart could be traced upto a width of 2 m. only. In the eastern side the rampart has been exposed to an available height of 4.80 m. with a basal width of 7 m. having ten courses of dressed stones in the outer face and the inner side had only seven courses of dressed stones used as a veneer at the base only. The inner core of the rampart consisted of mud bricks and mud lumps. Four whitish clay bands at regular intervals show the stages of construction of this massive structure. Both the inner and outer side of the rampart has a batter of 20° . The inner side of the rampart has been plastered with a whitish clay having a thickness of 5 cm. After some time a revetment with a width of 1.70 m. of 20 courses of mud bricks standing on one course of rubble cushion was added to inner side of the rampart. The revetment was perhaps necessitated due to the damage in the outer side.

(5) *The Ramp* : For inter-communication between the two areas a ramp was made which involves three stages.

(6) *Entrance* : In the southern side an entrance having a width of 1.80 m. has been found in a dilapidated portion of the rampart.

(7) *Structures of House Complexes*: It must be noted here that no complete house plan is available in the citadel area due to paucity of area of excavations in the levels of period IA. However, five structures of three structural phases, mainly walls belonging to houses have been found.

B. (1) *Residential Annexe* : Here also the exact dimensions could not be attested to as only the southern side and a portion of eastern side could be excavated. The available east-west width of the residential annexe is 46 m. Keeping the analogy of the superimposed structures it may possibly be also roughly squarish in shape.

(2) *Rampart* : The southern rampart has been available mostly in a disturbed condition having a width of 3.60m. to 4 m. In south eastern corner the eastern rampart exposed to a height of 2 m. has been found to a length of 6.70 m. with a basal width of 3.60m. having a batter of 12° built over a 70 cm. raised ground having rubble and mud brick foundation.

(3) *Entrance* : An entrance of very humble pretensions could be noticed at the south eastern corner of the rampart of which only one arm could be traced. On the outer side a slow rising ramp leading to the entrance could be noticed.

(4) *Structures of House Complexes* : A good glimpse of the Harappan architecture is available in the residential annexe. The complex, in short, consists of a lane with a width of 4.20 m. flanked by houses with a court-yard on both the sides having in one of the houses a bath room with a soakage jar outside embedded in the lane with a safe enclosure for checking the over flow of the water into the lane and a covered drain built of stones in two phases running in east west direction. Probably the later drain connected the soakage jar. The area of the rooms could be reconstructed which is 2.20×2.70 and 1.30 m.

Period IB

(1) *Settlement Pattern* : During this sub-period there does not seem to be any marked change in the settlement as such. As a matter of fact same areas in citadel and residential annexe remained to be occupied.

(2) *Citadel and Rampart*: The ramparts of the citadel remained same as in Period I except the addition of a revetment of mud brick (1 m. wide) in the eastern rampart of the citadel in the inner side, necessitated due to the extensive damage in the outer side. The basal width was now reduced to 6 m.

(3) *Ramp* : Habitational activity led to the rise of the ground level in the eastern side towards the residential annexe and hence a ramp is available represented by the compact clayey yellowish hard earth deposit on the top to climb up during Period IB.

(4) *Entrance* : It appears that in Period IB there was some renovation or addition to the gateway complex. The exact nature and placement of the entrance in this gateway complex is not discernible. However, a wall running east-west and turning north having 6 courses is quite suggestive of the fact of a gateway complex. The length of the wall is 16.30 m. east-west and 8.80 m. north-south.

(5) *Structures of House Complexes* : Only four group of structures made of rubbles have been found. These are mainly walls of partially exposed rooms of houses. The average thickness of walls is 1.50 to 1.70 m. and have 1 to 5 courses of rubbles.

(6) *Rampart*: There is no evidence to suggest that rampart of the residential annexe was elaborated in IB. The same structure was used.

(7) *Entrance* : The south-eastern entrance to the residential area was not used in Period IB. Instead, there was an entrance in the southern side, a rectangular structure of two courses of stones measuring 9.05×4 m. This enclosure has a side room towards west, measuring 2×4 m. The walls have a width of 75 cms. This enclosed area has an entrance in the northern side, having a width of 1.50 m. and a few pieces of flat slabs within this gap suggest the paving at the entrance. A similar gap having a width of 1.50 m. provided in the northern wall of the enclosure.

(8) *Structures of the House Complexes* : There are six groups of structures mainly house walls and a drain which could be exposed within the residential annexe.

Period IC

(1) *Settlement Pattern* : An elaborate picture of the settlement pattern at Surkotada is available from the latest Period where extensive digging has brought to light a citadel and a residential annexe which is fortified with corner bastions and an inter-communicating passage in between. Besides an elaborate gateway complex in southern side of the citadel adds grandeur to the architectural achievements of the people. At the close of the Period IB a thick but uneven layer of ash indicating a wide spread conflagration has been noticed throughout the site, but the continued existence of the Harappans does not admit of a break in the culture sequence at the site

(2) *The Citadel* : Following the footsteps of their predecessors at this site the people constructed a citadel of rubbles and dressed stones having an area measuring 60×60 m.

(3) *Ramparts* : The massive rampart of the citadel has an average basal width of 2.50 to 4 m. In the western side it has an exposed length of 40 m. having an extant height of 4 to 4.50 m. with 13 to 20 courses of rubbles. It has two successive revetments. The southern rampart has been exposed to a length of 56 m. with an extant height of 3.50 m. and having 17 courses of dressed stones. Due to damage, revetments have

been provided in south-western and eastern sides. A platform measuring 3.50×7.30 in the south-eastern side, has been found. The eastern rampart has been exposed to a length of 28m. with 9 to 12 courses of stone masonry. Repairs were carried twice to the eastern rampart. In the first instance it was repaired with mud bricks and mud lumps and a facing provided by mud bricks ($10 \times 20 \times 40$) laid in ashy mortar. Later on when damage occurred again a 3 m. wide revetment of massive dressed stones was provided. The northern rampart which is available in a disturbed fashion has been traced to a length of 4 m. with a width of 4 m. having 7 to 9 courses.

(4) *Bastions* : Squarish dressed stone masonry bastions were provided at the corners of the rampart out of which two have been exposed at the south-western and south-eastern corners of the citadel measuring 10.50×10.50 and 12.20×9 along with revetments which were necessitated by extensive damage due to the floods in the nearby nala. An interesting feature is the covering of the south-western bastion with burnt bricks (size $8 \times 16 \times 33$ cm.) in the last phase of structural activity.

(5) *Gateway Complex* : In the southern side of the citadel a centrally placed gateway complex having a 10×23 m. projection from the southern rampart having a steps with a balustrade and a ramp flanked by two rooms in the rear probably for inspection or a checkpost where the entrants were checked and could enter the main entrance of the citadel through the adjoining three flight of steps. The main entrance was flanked by two guard rooms (size 2.50×2.80 m).

(6) *Inter-communicating Passage* : An entrance from the lower residential area to the citadel was cut into the eastern rampart. A semi-circular structure was provided on the citadel side of this passage. This, however, belongs to the earliest phase of structural activity in Period IC. Subsequently the passage was partially blocked and a drain was left on the southern side of the passage. The drain has two phases of construction and use.

(7) *Structures of House Complexes* : There are in all ten groups of structures available which consist of houses, and, walls of partially exposed rooms of houses. Out of these is a nine-roomed house complex, the biggest exposed so far in the citadel area. It is located towards the western side of the citadel and the rooms are abutting the main rampart. The house complex opens to east and has a lane in front of it. Similarly on the northern and southern sides there is no structure joining it. It has an independent identity. Only three to four courses of dressed stone masonry is available in the walls of the rooms having an average width of 60 cms. to 70 cms. The back side rooms yielded considerable pots and a flat copper chisel. The size of the rooms vary from 4.30×3.60 to 1.80×4 m.

Another complete room having quadrilateral shape with dressed stone walls of 4 to 6 courses has been exposed. It has an entrance in the eastern side facing the lane. The size of the room is 4×6 m. This structure, as it stands separately, has an individuality of its own.

Rectangular platform (2×1.40) outside the houses is an important feature in other buildings.

The houses are separated by lanes which are not straight. A drain has also been exposed.

A few random walls available outside the southern rampart may indicate some temporary residential activity outside the citadel in Period IC. Does it indicate

over population?

Residential Annexe

The fortified residential annexe occupied an area of 60×55 m.

(1) *Ramparts*: A rampart wall emanating from the citadel area has been exposed in the southern side to a length of 18.60 m. and then turning north to a length of 24 m. having a basal width of 3.40 m. It consists of 3 to 6 courses of dressed stone masonry. Similarly in the northern side the rampart has been partially exposed to a length of 8 m. with 2 to 3 courses of stones in a disturbed condition having a width of 3.40 m.

(2) *Bastion*: A rectangular bastion in the south eastern corner measuring 4.50×2.50 built in two tiers with eight courses of rubbles and dressed stones have been exposed.

(3) *Entrance*: The entrance to the residential annexe is a simple cut or gap, 1.70m. wide in the southern rampart, which is very much damaged. It appears that just near the entrance there was probably a guard room, measuring 2.50×2.20 m. This guard room is made in the rampart itself. The identical guard room on the other side could not be available, due to the heavy damage but its possible existence could be surmised.

In all, 14 groups of structures of houses have been exposed in the residential area. An average house was found to comprise five inter-connected rooms (average measurement of the room is 2.90×2.50 m.) in the rear, and a courtyard enclosed on the three sides, used possibly as a cattlepen, in front of the street was a platform for sitting or selling merchandize.

In the Sequel

- (1) The area of citadel and residential complexes remained same through the successive sub-periods.
- (2) The thickness of the citadel rampart decreased from 7m. in Period IA to 4m. in Period IC. The width of the rampart of the residential complex remained more or less same, i.e., about 3.40 m.
- (3) In all the three sub-periods, mud bricks measuring $10 \times 20 \times 40$ cm. have been used. Baked bricks are available only in the latest phase of Period IC.
- (4) While in Period IA mud bricks, mud lumps and dressed stones have been freely used in the construction of the rampart and also in other structures, in Period IC, the rampart has been fully made of rubbles and chiselled stones. This change shows preference for stones involving easy and developed techniques of quarrying with better tools.
- (5) Drains are available in Period IA, IB and IC.
- (6) Considerable elaboration has been noticed in the gateway of the citadel in Period IC as compared to the available evidence in Period IA. The entrances in the southern and south-eastern side in the citadel and residential annexe respectively are just a simple opening of moderate dimensions without any architectural embellishment.
- (7) While in Period IA the citadel and residential complexes had inter-communicating passage through a ramp in the eastern side of the rampart of the citadel, in Period IC an elaborate passage passing through the eastern rampart with a semi-circular pedestal in citadel side (attaching architectural importance to the area) joined the two areas.
- (8) The structural features of the outer gateways and the inter-communicating passage

preclude the possibility of any vehicular traffic within the citadel and the residential area.

- (9) The overall picture of the settlement pattern is very much elaborate in Period IC. However, in the residential complex the streets are not straight.
- (10) At Surkotada, throughout a compact citadel and residential annexe complex has been found but no separate city complex as such has been available. Of course, beyond the *nala* about 500 m. south-east, there is one low mound now mostly washed away which may represent some sort of a habitation but the Harappan vestiges are very little. Was Surkotada a defensive complex through the centuries to provide protection to the eastward movement of the Harappans or a well protected trading centre? Well fortified area, guard rooms in the citadel and residential annexe, engraved figure of a soldier from Period IC, a large number of sling balls and bone arrow heads from all periods are very interesting evidences in this direction. Perhaps, a little more thinking in this direction is desirable. In an expansion of the people to farther areas this hypothesis may not be ruled out particularly when the Harappans were in Saurashtra, and Kutch was a half way house between Sind and Saurashtra. It is interesting to note that the citadel complex at Surkotada having a residential annexe is remotely comparable with the citadel mound at Kalibangan and Kot Diji complex. One thing is certain that the Harappans besides the twin settlements had other patterns of settlement also such as we find at Surkotada depending precisely on the purpose and environment.

Kalibangan and the Indus Civilization

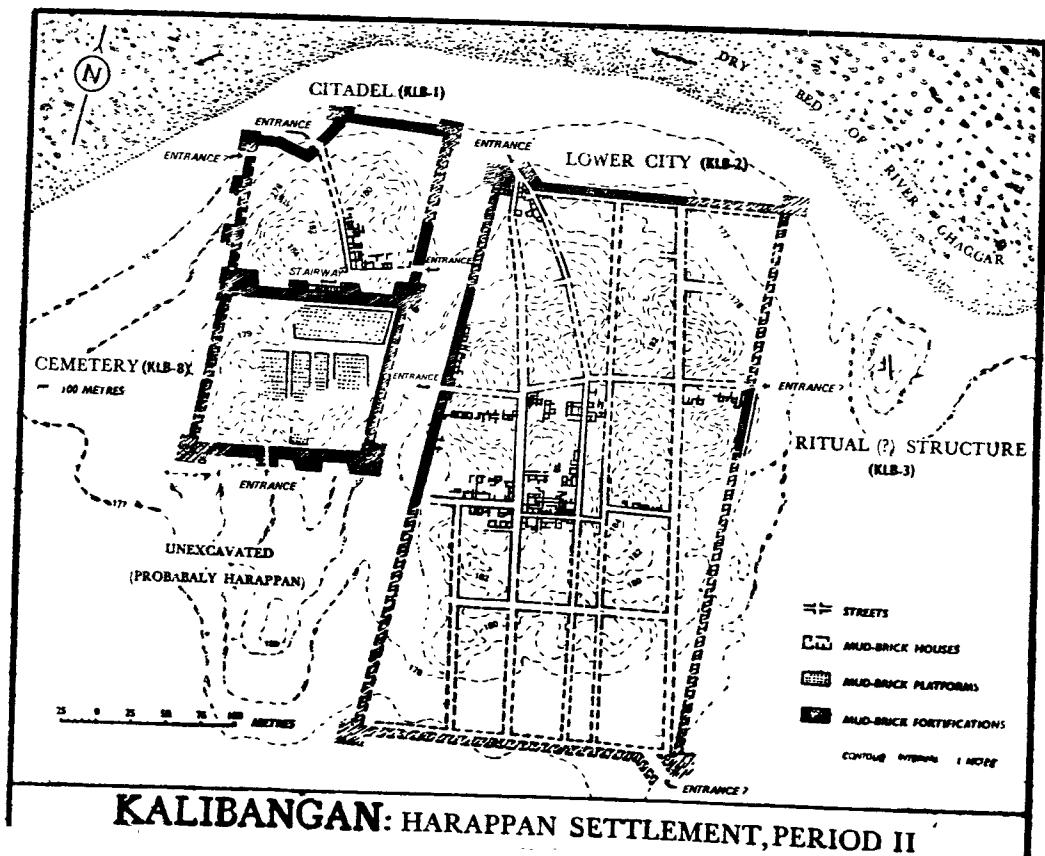
B. B. LAL

AMONGST the more important sites of the Indus Civilization (also called the Harappa Culture) excavated on the Indian side of the border since Independence, the name of Kalibangan easily comes to the fore. Not only has it thrown fresh light on several aspects of that civilization, but has also revealed a settlement which existed at the site prior to the arrival of the mature Harappa Culture. It is likely that this pre-Harappan Culture, along with its cousins further to the west, may have contributed in no small measure to the make-up of the Indus Civilization as a whole.

Kalibangan in the local language means 'black bangles'. The name has been given to the site evidently because on its surface lie scattered large quantities of broken terracotta bangles and nodules which have turned black through millennia of exposure to the weather. With its latitude $29^{\circ} 25' N.$ and longitude $74^{\circ} 05' E.$, Kalibangan is located in the revenue jurisdiction of District Ganganagar, Rajasthan. The nearest railway station is Pilibangan which lies roughly midway between Hanumangarh and Suratgarh on the Northern Railway. From Delhi, it lies some 300 kilometres to the north-west.

The site is located on the southern bank of the Ghaggar which is now dry, but must have anciently been a substantial river, as indicated by its span. In its upper reaches it is joined by the Sarasvati which still carries water ; and it appears that in ancient times the combined stream went under that name. The Ghaggar-Sarasvati combine now dries up around Sirsa. The dry bed is traceable further downstream, in Pakistan, under the name Hakra or Ghaggar, but one is not sure whether it joined the Indus or went direct to the sea. A systematic exploration of its banks, which are studded with ancient sites, might perhaps yield the answer.

Like its classic counterparts, *viz.* Mohenjo-Daro and Harappa, Kalibangan also has two mounds, a smaller one (called KLB-1) to the west, and a bigger one (KLB-2) to the east (*fig. 1*). However, besides these two standard mounds, Kalibangan has a third one (KLB-3), but it is very small. It is located to the east of the bigger mound. The overall perimeter of the site of Kalibangan is between 1.5 to 2 kilometres ; the mounds rise to an average height of about 10 metres above the surrounding ground-level.



KALIBANGAN: HARAPPAN SETTLEMENT, PERIOD II

Fig. 1. Kalibangan : Harappan Settlement, Period II.

The excavation at Kalibangan was commenced in 1961 by the Archaeological Survey of India, under the direction of the present writer. He was soon joined by B.K. Thapar and, towards the end, by J.P. Joshi, both senior officers of the Survey. After nine seasons, the work came to a close in 1969.

Two periods of occupation were identified at Kalibangan, named respectively Periods I and II, from bottom upwards. Since Period II belonged to the Harappa Culture and there was a break of occupation between it and Period I, the latter has been given the designation 'Pre-Harappan'. However, as would be discussed at the end of this paper, the culture represented by Period I, along with its cognate cultures elsewhere in the Indus valley, may well have been 'proto-Harappan' or for that matter 'early Harappan', giving rise to what we are used to call 'Harappan', which, indeed, is the mature form generated through an evolutionary-cum-revolutionary process.

Period I (Pre-Harappan)

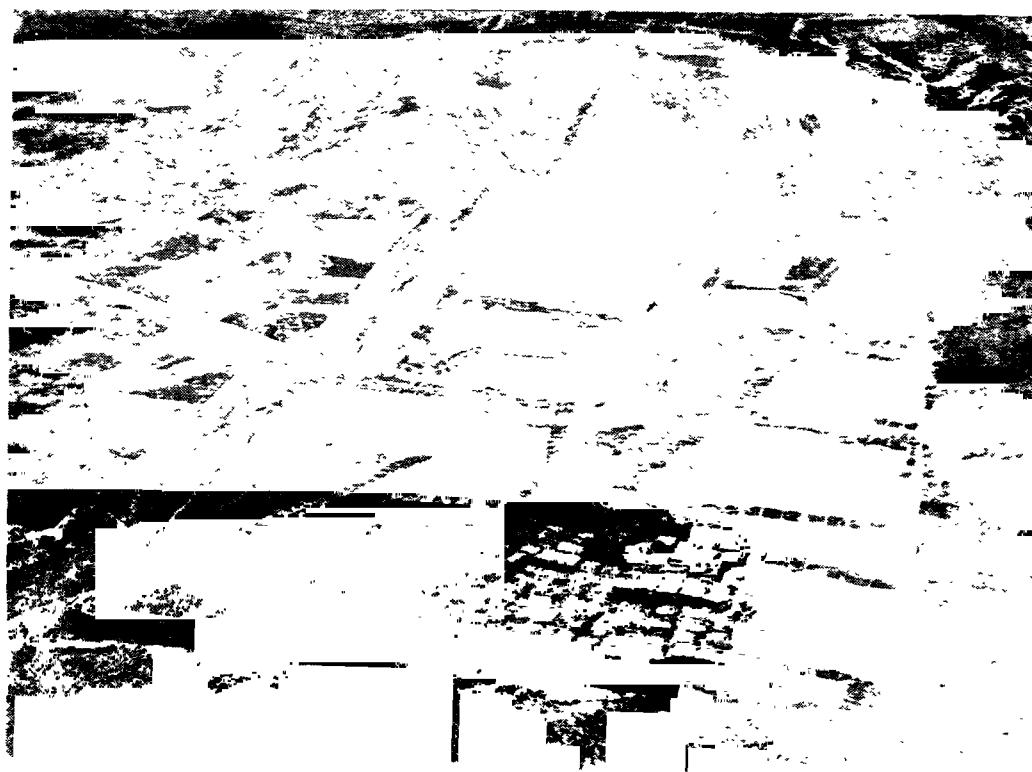
The pre-Harappan settlement, like its Harappan successor, was fortified. Made of mud-bricks (size $30 \times 20 \times 10$ cm.), the fortification-walls formed a rough parallelogram on plan, oriented more or less along the cardinal directions. The western and eastern

sides measured 240 m. and 250 m. respectively. Of the shorter sides, the one on the south measured 170 m. That on the north did not run in a straight line. From the western end it first ran to the east-south-east for a distance of about 50 m. and then turned to the north-east, making another 40-45 m. It then took a further turn, this time due east, joining the eastern wall after a distance of about 115 m. Within the re-entrant angle of the northern wall just described, there lay an entrance to the fortified area. From the point of view of defence this kind of entrance must have been very useful, since in the event of an attack it could be protected from the tops of the flanking walls on either side. As the fortification-walls have been eroded at places, it is difficult to say anything about other entrances which, one guesses, would have existed.

Of the fortifications, two structural sub-periods were noted. In the earlier one, the width of the walls ranged around 1.90 m., while in the latter, there was an addition on the inner side, the total width ranging between 3 and 4 m. There is indication that the walls were also plastered.

The northern opening provided an easy access to the river which lay immediately in front of it. Since the width of the entrance is about 5-6 m., one imagines that through it passed the vehicular traffic, going into the settlement through sufficiently wide streets : indirect evidence for the use of bullock-carts comes from the discovery of terracotta cart-wheels (solid) and bull-figurines from the pre-Harappan levels. Unfortunately, the area near the entrance could not be excavated owing to the superimposed Harappan deposits and hence no lay-out plan of the streets and houses could be determined over here. In the south-western part and to some extent in the south-eastern also, where the superimposed Harappan strata were negligible, the pre-Harappan settlement was excavated. In the latter area, a 1.5 m. wide lane was also identified (*pl. I*).

Plate I. Kalibangan : a pre-Harappan lane, with remains of houses on either side.



The pre-Harappans lived in well-laid-out houses, oriented roughly along the cardinal directions. These were made of mud-bricks whose size was the same as in the case of the fortifications-walls. The style of the masonry was that of placing headers and stretchers in alternate courses, which is commonly known as the English bond. Evidence of plastering the walls with mud and chaff was also available. In all, five structural sub-periods were recorded (*pl. II.*) accounting for a total deposition of about 1.60 m. That the pre-Harappans knew kiln-burnt bricks is duly attested to by their use in a drain. In fact, even their Harappan successors used kiln-burnt bricks only sparingly.

An average pre-Harappan house consisted of a courtyard and a few rooms along its margin. In the courtyard, evidence of cooking was obtained ; for it ovens of the overground as well as underground varieties were used (*pl. III.*). It is interesting to note that these ovens resemble the *tandoors* so popular even now in that area as well as

Plate III. Kalibangan : pre-Harappan ovens.



Plate II. Kalibangan : pre-Harappan structures



in the neighbouring regions of Punjab and Haryana. However, the method of preparing the dough may not have been exactly the same as it is now. There were no rotary querns then to produce fine flour. The cereals were perhaps ground on a saddle quern with a muller, examples of both of which were found in the excavation. In the courtyard were also found cylindrical pits lined with lime-plaster. These were sufficiently wide and deep and are likely to have been used for storage of food-grains. Although no grains as such were encountered in the excavation, there is ample evidence for well-organized

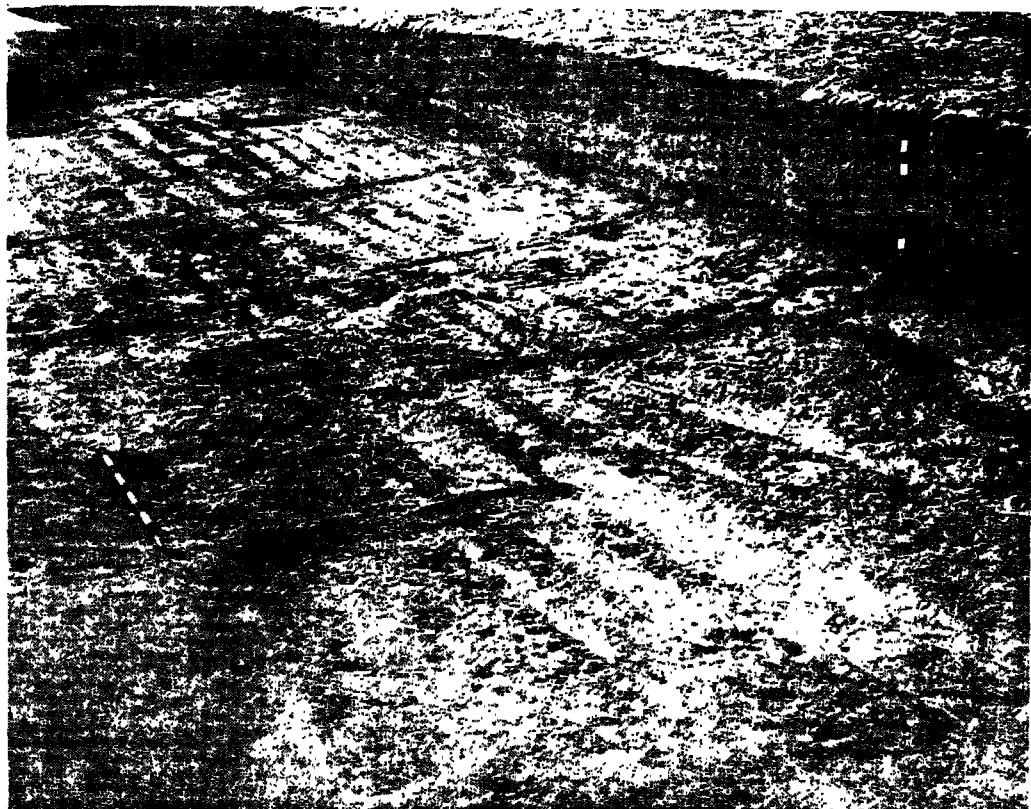


Plate IV. Kalibangan : pre-Harappan ploughed field.

agricultural activities by these people. About a hundred metres to the south of the settlement were identified the remains of an agricultural field, with some of the ploughed furrow-marks still intact. And no less interesting is the fact that the pattern of ploughing the field continues to be the same even now in that region. The excavated furrows (*pl. IV*) formed a grid on plan. Thus, one set of the furrows was oriented east-west, while the other ran north-south. The individual furrows in the former were interspaced at a distance of about 30 cm. and those in the latter, at 1.9 m. In the crop-pattern in vogue now, horse-gram is grown in the short-distanced furrows and mustard in the long-distanced ones. The choice evidently seems to depend on the size and lateral spread of the respective plants, the latter being bigger than the former (*Lal, 1970-71*).

Technologically, the pre-Harappans were in what may be described as the chalcolithic stage, *i.e.* using copper alongside stone for the preparation of tools. Thus, in the latter category were blades of chalcedony and agate. Some of these were backed and serrated and it is likely that they were hafted in a row on a wooden handle and used for cutting and sowing. Even harvesting must have been done with these. The use of copper for tools is duly attested to. Of it were found an axe and a *parasu*, the latter having a very distinctive shape (*pl. V*). It has no parallel in the Harappan ensemble, but examples of it have been found at two other places, *viz.* Mitathal, District. Hissar, Haryana where it occurred in Period II B (*Suraj Bhan 1975, fig. 14 A, 7*) and Khurdi in District Nagaur, Rajasthan, the actual context in this case, however, being not known (*ASI 1961, pl. III B*). Here it is also worth mentioning that this type of tool is still used in Rajasthan for cutting scrubby bushes. It is hafted at the end of a wooden rod.

Besides carrying on agriculture, the inhabitants seem to have engaged themselves in cattle-breeding and hunting. Their probable interest in cultivating fruit-plants is suggested by the painting of a banana-plant (fig. 2:11) on the pottery. To the dietary were also added meat, the fish and fowl (fig. 2:19, 20).

That the ladies bedecked their person with a variety of jewellery is suggested by the find of bangles, variously of copper, shell and terracotta, and of beads made of agate, carnelian, shell, copper, etc. The picture would have, of course, been clearer had we got some terracotta figurines.

It is not known how these pre-Harappans buried their dead. The graves encountered in the cemetery area were those of the Harappans, as indicated by the pottery and other grave-furniture found in them. Further search might, however, reveal some evidence in this regard.

The most distinctive item in the pre-Harappan assemblage was the pottery [*pl. VI. (a) and (b)*]. On the basis of the fabric, it has been divided into six categories, which were assigned during the field-work the alphabetic numbering, A,B,C,D,E and F.

Of these, the pottery of Fabric A (fig. 3:1-3, 7) was the most prolific as well as the most notable because of its essentially non-Harappan look. In this case, the pots were turned rather indifferently on the wheel, with the result that the striation marks were irregular and weak. No slip seems to have been used, the colour of the wash being dull-red to light pink. The pots were painted over in two colours—a basic black often supplemented with white (hatched in the drawings). In this context it may be recalled that the Harappan paintings are essentially monochrome, the colour used being black. The use of white is a pre-Harappan feature which is also noticeable in the pre-Harappan pottery of Kot Diji (*Khan 1965*). The painted designs were confined mostly to the upper part of the body and,



Plate V. Kalibangan : pre-Harappan copper objects.

the impression left on the mind after seeing this pottery is that it specializes in having thick bands round the rim, which are sometimes so thick as to descend down to the shoulder. In addition, there were the other designs like criss-crossed oblique lines (fig. 3:7) a row of

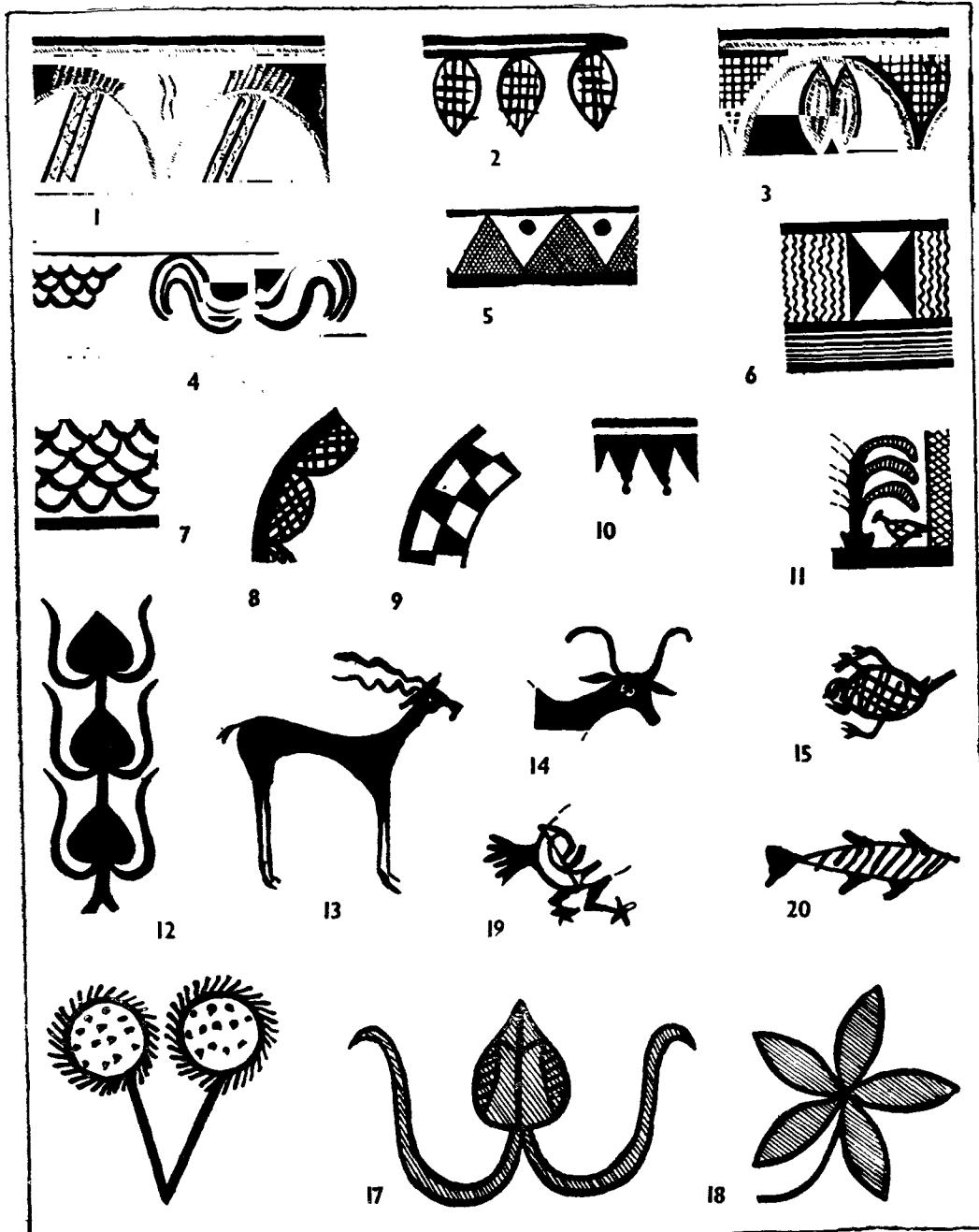


Fig. 2. Kalibangan : painted designs on pottery of Period I. Nos. 1-5, on Fabric A; 6-11, on Fabric C; 12-18, on Fabric B; and 19-20, on Fabric E. Solid line or filling denotes black colour; hatching, white.
Not to scale.



Plate VI(a). Kalibangan pre-Harappan pottery.



Plate VI(b). Kalibangan pre-Harappan pottery.

semi-circular arches with the upper intervening space either hatched or filled (fig. 2:1, 3), (fig. 3:3) latticed triangles (fig. 2:5), rows of loops one below the other giving the effect of the fish-scale pattern (fig. 2:4). Amongst the more common shapes occurring in this fabric were vases with everted rim, globular body and disc/ring/pedestal-base; and bowls and basins with convex or tapering sides. Particular mention may also be made of a vase with hole-mouth (fig. 3:3).

In Fabric B only one shape was encountered, namely that of a large jar with globular body and everted rim (fig. 3, 6). It had an interesting treatment of the surface. The portion from the rim down to the shoulder was slipped (red), while that below it was given a further coating of sandy clay which was roughened either by combing it or by impressing it with tortoise shell or by some similar device. From the present-day parallels it would appear that the jar was used for storing water, the rusticated sand-clay coating being provided to keep the water cool. While the slipped upper portion bore thick and/or thin bands in black pigment, the rusticated surface had a richer variety of designs, including faunal motifs like the stag, bull, duck, scorpion, etc. (fig. 2:13-15) and floral motifs such as a five-petalled flower, stylized sun-flower (?) and so on (fig. 2:16-18). In the case of the floral motifs, white pigment was also used in addition to the black.

From the point of view of the consistency of the clay, careful potting, sturdiness of the ware, colour of the slip and even of some shapes and painted designs, Fabric C was the nearest to the Harappan Ware. Thus, its clay was finer than that in the cases of Fabrics A and B, it had a red to plum-coloured slip all over the body and the pigment used for the paintings was essentially black, the white being rather rare. The motifs included, besides the ubiquitous thick or thin black bands, metopes, crossed-hatched loops, a row of filled-in and apex-down triangles, fish-scales sometimes interspersed with dots,

and the like (fig. 2:6-10). Noteworthy was also the depiction of a fowl underneath what looks like a banana plant (fig. 2:11). Amongst the shapes, besides elongated vases, bowls and basins, particular mention may be of dishes-on-stand or cups-on-stands (fig. 3: 4, 5), and lids, these three being reminiscent of the Harappan pot-forms.

Fabric D also reminds one of the Harappan pottery, although again in a very limited way, namely on account of its general sturdiness and red slip, beside two pot-forms. These last-named included flanged jars (fig. 4:3) and a tall cylindrical vessel which recalls the perforated jar in its general shape, though without the perforation. However, the most distinctive items in this fabric were troughs and basins bearing, on the interior, deep incised

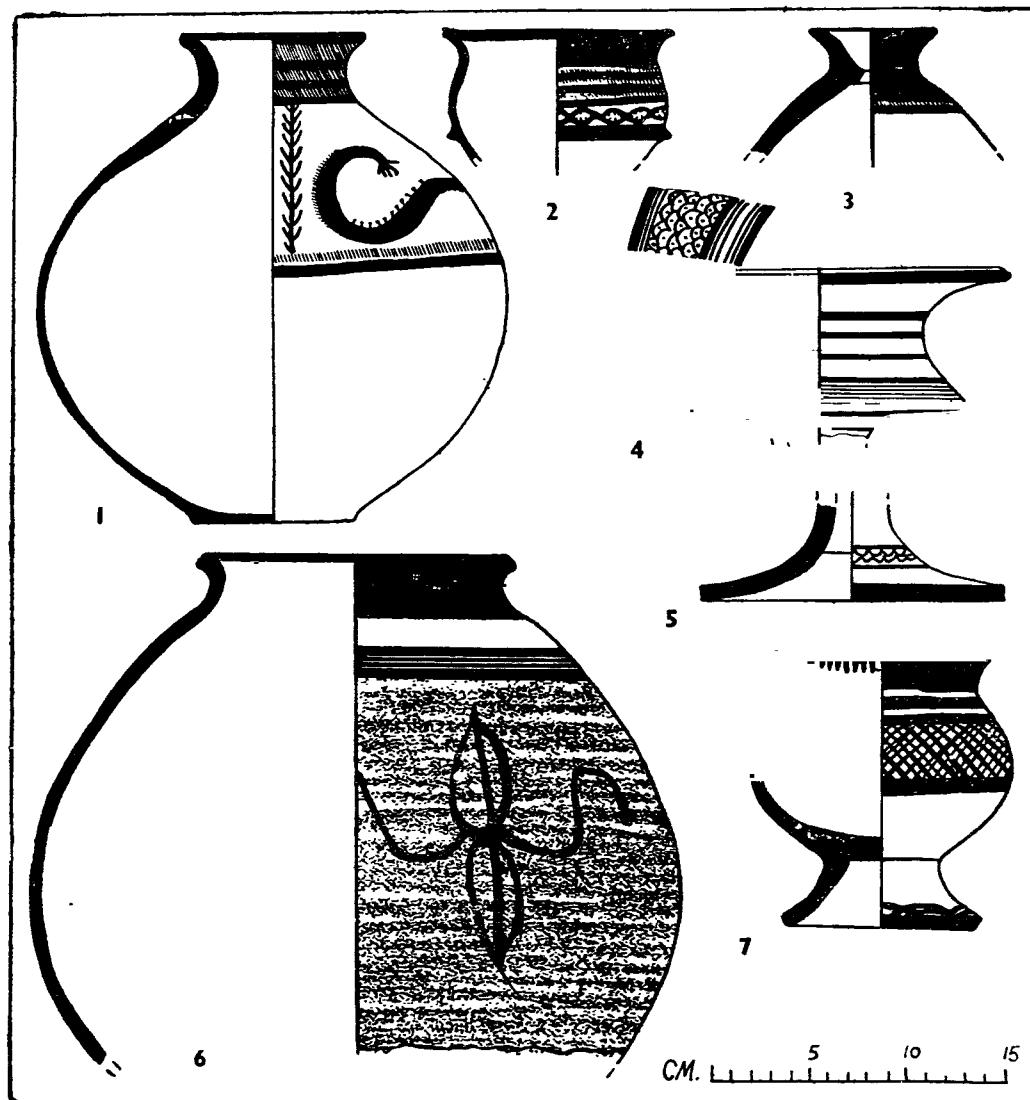


Fig. 3. Kalibangan : pre-Harappan pottery. Nos. 1-3, and 7 Fabric A; 6, Fabric B; and 4-5, Fabric C. The painted designs are in black as well as white colours, the latter being shown here through hatching.

designs which included wavy and/or horizontal lines, the latter often cross-hatched with vertical or oblique lines or lenticulars (fig. 5). On the exterior were noticeable cord-impressions and/or horizontal bands in black pigment. The basins, with their characteristic surface treatment, remind one of similar examples in the pottery of Period IIB at Amri (*Casal, 1964*), and the parallelism may have some culturo-chronological significance in the gamut of the pre-Harappan cultures.

Fabrics E and F were differentiated primarily because of their colours, the former being reddish buff or buff and the latter grey. In terms of shapes they had nothing new to offer. Thus, in Fabric E there occurred vases with elliptoid body, jars with or without flanged rim, basins, knobbed lids, cups-on-stand and dishes-on-stand (fig. 4: 2-6). The painted designs, executed in both black and white colours, included, besides linear and curvilinear motifs (amongst which the fish-scale may be noted), a floral design of what looks like a multi-petalled flower, and faunal designs like the fish and fowl (fig. 2:19-20).

The shapes represented in Fabric E were dishes-on-stand (fig. 4:7-8), globular vases, bowls and basins, the last-named with ring-base. On the grey surface were drawn some simple linear and curvilinear designs in black pigment, with occasional use of the white (fig. 4:9).

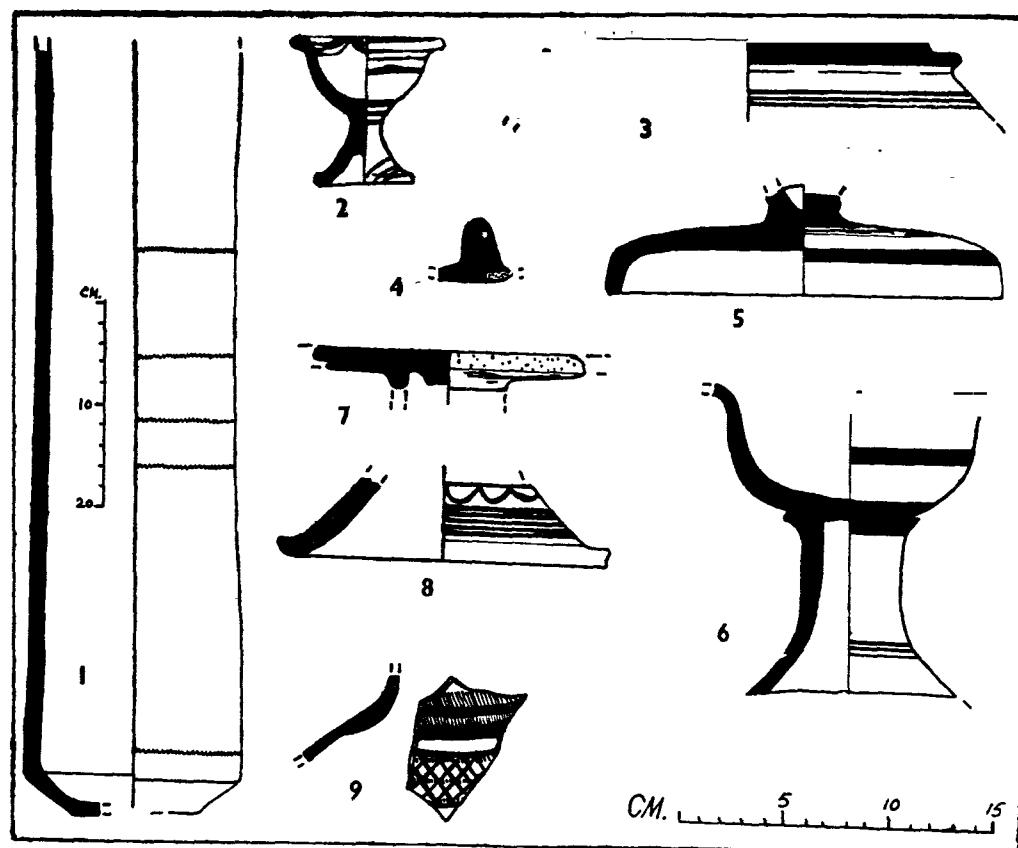


Fig. 4. Kalibangan : pre-Harappan pottery; No. 1, Fabric D; 2-6, Fabric E; and 7-9, Fabric F. The painted designs are in black as well as white colours, the latter being shown here through hatching.

In passing one may also refer to the occurrence of some graffiti on the pre-Harappan pottery, including, for example, the arrow-mark which is also available on the Harappan pottery. The data, however, are so meagre that it is difficult to say anything more about their significance, particularly in the Kalibangan context.

The excavation revealed some very important evidence regarding how the settlement of Period I came to an end. At several places in the trenches was observed cleavage-cum-displacement of the strata (*pl. VII*) and walls, which evidently was the result of some earth-movement. It appears, therefore, most likely that the site was deserted because of an earthquake. And if this were the case, it would be the earliest recorded earthquake in India.

Period II (Harappan)

The occupation of Period II did not come into being immediately after the end of Period I. This is indicated by the erosion of the then mound (KLB-1) at several places and by the accumulation of blown sand in some of the depressions, before the re-occupation of the site by the Period II people, namely the Harappans. What was the length of the time-gap, it is difficult to gauge, but in this context a fact may be noted that in the lower levels of

Plate VII. Kalibangan : pre-Harappan faulted strata, indicative of earth-movement.

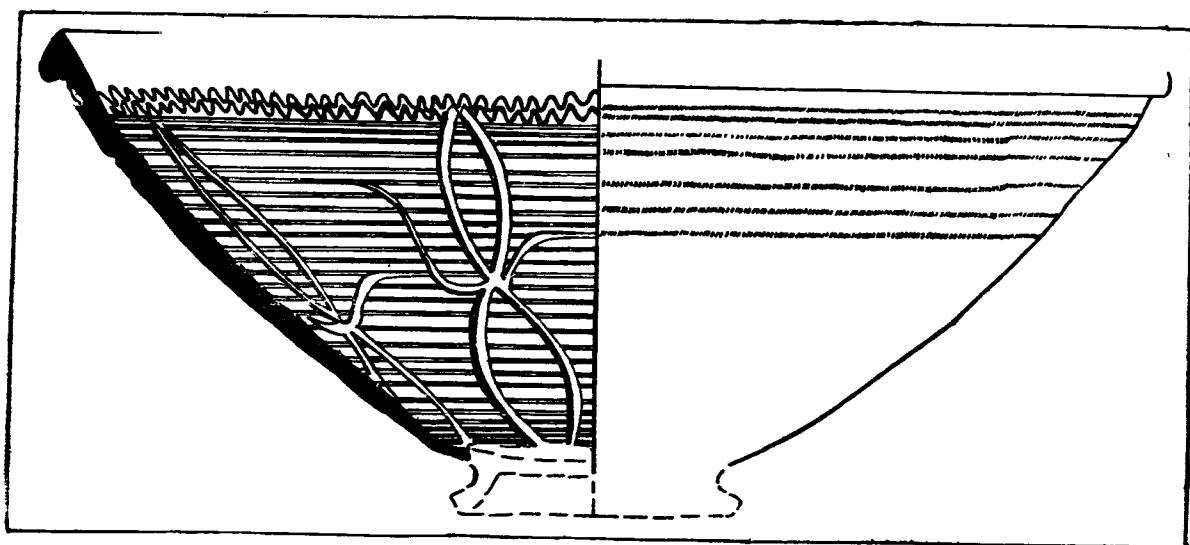


Fig. 5. Kalibangan : pre-Harappan basin in Fabric D. Diameter at rim 64 cm.

the Harappan town-site, which was started on a fresh patch of land (KLB-2), the pre-Harappan pottery was found alongside the typical Harappan one. This would indicate that the pre-Harappans had not died out as a result of the earthquake, but had only shifted to some other place in the region, and when the Harappans came to Kalibangan the descendants of the former also joined them, though perhaps in a small number.

The Harappan settlement of Kalibangan, as already stated earlier, was in the metropolitan style. There were two clear-cut parts of it : a 'Citadel' to the west and a 'Lower Town' to the east (fig. 1). In order to give the former some height, it was located on the ruins of the pre-Harappan settlement (at Mound KLB-1), while the latter was sited on an unbroken ground close to it, the intermediary gap being only about 40 m.

The Citadel-complex is further divisible into two equal parts, southern and northern, both being duly fortified, with a bipartite wall in between (c.f. fig. 1). Each part formed a rhomb on plan, with the sides measuring 120 m. Thus, the Citadel as a whole was in the form of a parallelogram, 240×120 m. in size, the longer-shorter axis proportion being 2 : 1. One may note this spatial concept of the Harappans, for their bricks also bore the proportion of 2:1 (length: breadth), the actual size being either 40×20×10 cm. or 30×10×7.5 cm.

The Harappans were wise enough to utilize the still visible portions of the pre-Harappan fortifications, and made thereto such additions and alterations as they deemed necessary. Thus, practically the entire existing outlines on the western and northern sides were made use of, including the gateway-complex on the north-west. On the eastern side, however, a fresh wall was laid out, a good deal to the west of the pre-Harappan wall, so as to conform to the pre-determined dimensions of the Citadel. A slight deviation from the pre-Harappan outline was also effected on the southern side.

Of the two rhombs of the Citadel, the southern seems to have been the focal one and the northern an adjunct, though conceptually inseparable. This is indicated not only by the features of the fortification-walls enclosing the southern rhomb, but also by the special structures laid out therein. Thus, while the fortification-walls of the southern rhomb were provided with towers at the four corners and two salients each on the northern and southern sides, the eastern and western fortification-walls of the northern rhomb butted against the concerned corner-towers of the former rhomb. It may also be noted that the two central salients of the northern wall of the southern rhomb projected outwards, i.e., into the area of the northern rhomb, making the former conceptually the primary one (cf.



Plate VIII. Kalibangan : view showing pre-Harappan structures below a salient of the bipartite fortification-wall of the Harappan Citadel. A part of the mud-plaster has been removed to show the mud-bricks behind. Abutting the base of the salient are the remains of the brick-on-edge paving.

fig. 1). The fortification-walls of the northern rhomb also had their corner-towers and salients, but that is another matter.

Two structural sub-periods of the fortification-walls were noted, in the earlier of which the brick-size was $40 \times 20 \times 10$ cm. and in the latter $30 \times 15 \times 7.5$ cm. It may, however, be clarified that the brick-size had nothing to do with the periodization of the Harappan settlement as whole, for right from the beginning the bricks used for the houses were of the smaller size, viz. $30 \times 15 \times 7.5$ cm. Thus, it is evident that bricks of the larger size were manufactured specially for the bigger structures like fortifications and platforms, although later on even this practice was given up. The width of the fortification-walls ranged between 3 and 7 m., although at one place on the southern side it reached up to 11 m. The salients projected about 8-9 m. from the outer face of the walls and ranged in breadth between 13 and 17 m. The maximum extant height was about 3.60 m. (*pl. VIII*). The walls, including the towers and salients, tapered up, and were provided with mud-plaster.

There were two entrances to the southern rhomb, one each from the south (*pl. IX*) and the north. These were either stepped or stepped-and-ramped, which shows that vehicular traffic was forbidden from entering the rhomb. Such a restriction would appear to be justified on account of nature of the buildings that lay inside : these were essentially of a religious or ritualistic kind, and thus out of reverence the people were expected to walk within the campus and not ride about.

The southern rhomb contained several mud-brick platforms, oriented along the cardinal directions, on each of which there stood a special structure. Although in most cases the details of these structures have disappeared owing to subsequent spoliation, there is reasonable evidence about their likely use. Thus, atop one of the platforms there lay a series of seven 'fire-altars' in a row (*pl. X*). Behind these fire-altars ran a wall in a north-south direction, which shows that people had to face the east while performing rituals at these altars. The altars were oblong on plan, sunk into the ground and lined with clay. They contained ash and charcoal, besides a cylindrical or faceted clay (burnt or unburnt) stele standing up near the centre. Though in the series under discussion only fragments of what are called 'terracotta cakes' were obtained, elsewhere these were found in sufficient numbers showing that they formed some kind of an 'offering'. To the west of these fire-altars lay embedded the lower half of a jar. It contained ash and charcoal and was evidently connected with the use of the fire-altars. Within a few metres of these altars were a well and a few bath-pavements suggesting ablutions before the performance of the ritual — a tradition still in vogue in India, amongst the Hindus.



Plate IX. Kalibangan : gateway on the southern side of the Citadel-complex.

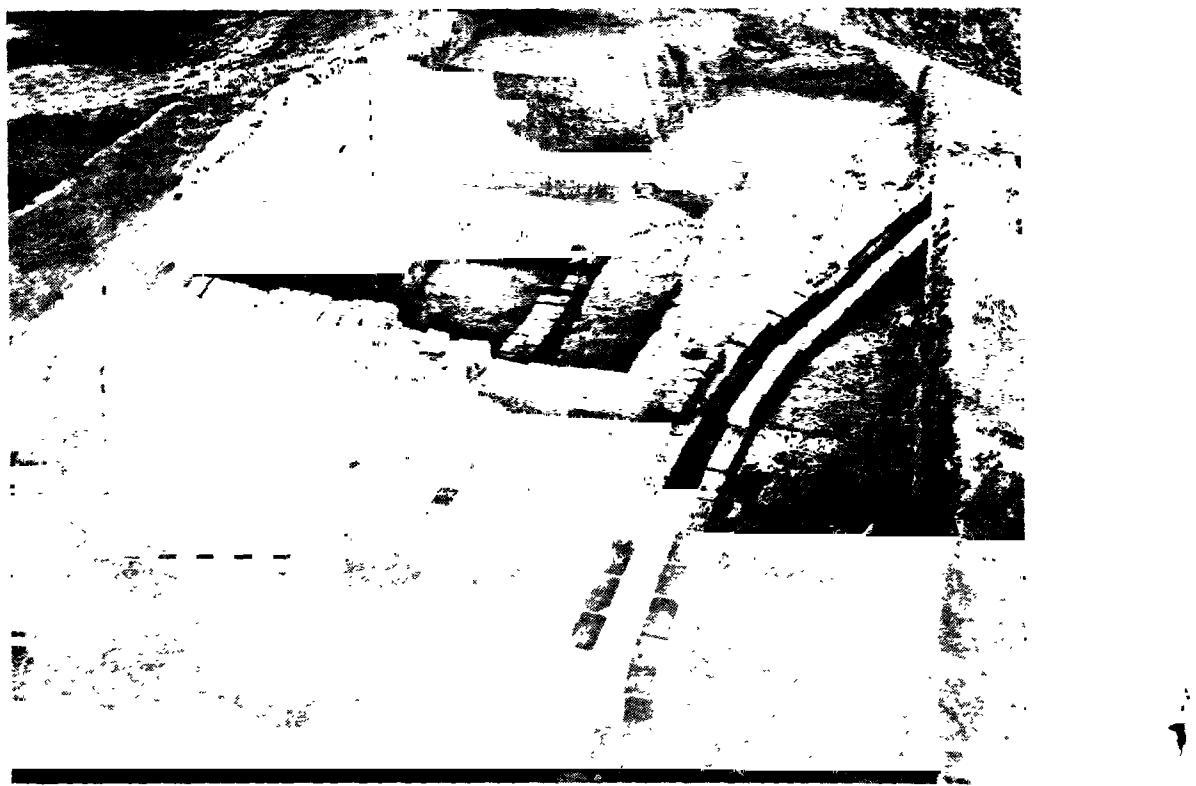


Plate X. Kalibangan : a row of 'fire-altars', cut through by a later drain, in the Citadel area. Harappan.

On another platform were located a well, a fire-altar and a rectangular pit lined with burnt bricks. In the pit there lay bones of the cattle and antlers (*pl. XI*), and it may not be unreasonable to assume here that some kind of sacrifice was involved. The idea of animal-sacrifice is perhaps also suggested by what is engraved on the two sides of a terracotta cake. On one side, an animal is being dragged by a person by means of a rope (?), while on the other side there occurs the figure of another person—most probably a deity, wearing a horned and feathered head-gear (*pl. XII*).

These platforms were separated one from the other by passage-ways through which flowed burnt-brick drains. As would be seen later, there were no such drains in the town-site. This shows that special care was bestowed on the cleanliness of this area, so that water emanating from the ritual baths did not make the passage slushy. The platforms were also separated from the fortification-walls. Thus, one could move around the former if one wished to do so. Access to the top of the platforms was had by means of steps ramps some remnants of which were ascertainable.

The northern half of the Citadel was altogether differently planned. It had no platforms with superposed 'temples', but only residential houses (*pl. XIII*). At the same time, it was not a residential area of the kind that the Lower Town was : the latter was very extensive and had a series of streets and lanes. The northern rhomb had limited

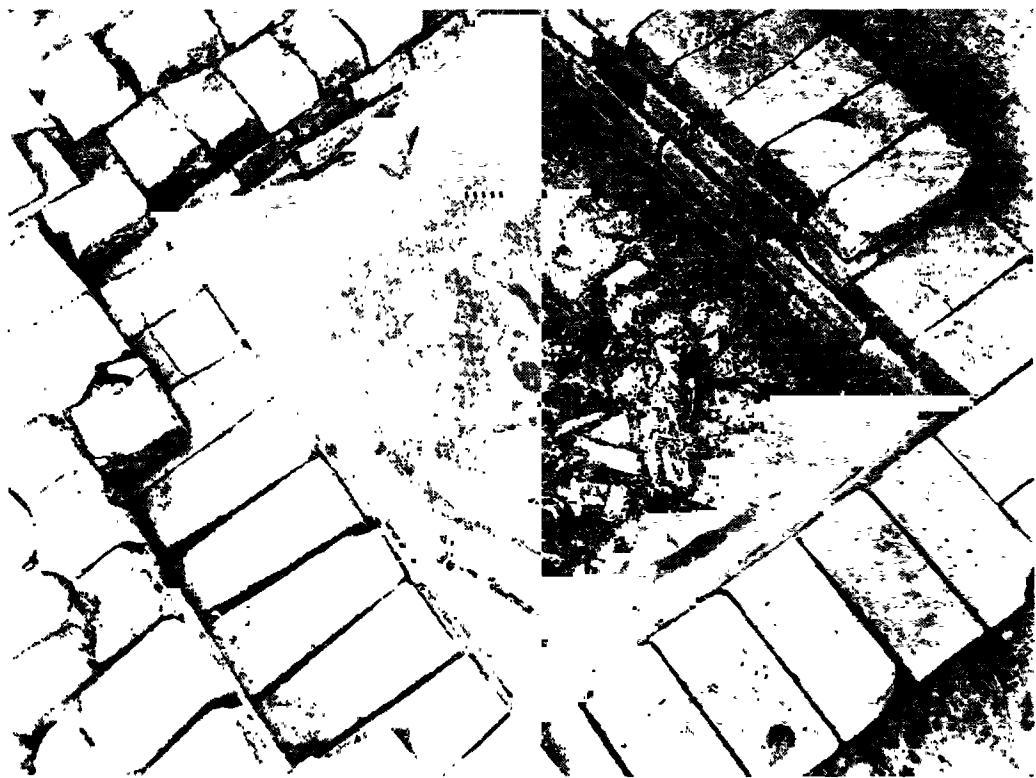


Plate XI. Kalibangan : brick-lined pit with animal bones, a top one of the mud-brick platforms in the Citadel area, Harappan.

occupancy, most likely by 'priests' or 'priest-administrators' who looked after the affairs of the southern rhomb. May be they also managed the general administration of the settlement as a whole.

The house-blocks were separated from the bipartite wall by a fairly wide passage which was also paved with bricks-on-edge (*pl. XIV*). Towards the east, this passage opened into a gateway through which communication was maintained with the Lower Town (fig. 1). The brick-on-edge paving, commencing from this gateway ran past the eastern of the two central salients (*pl. VIII*) and perhaps went up to the stepped entrance into the southern rhomb.



Plate XII. Kalibangan : terracotta 'cake', bearing incised figures on the two sides, Harappan.

(*pl. XV*): and one is tempted to regard it as a ceremonial passage-way on which probably marched the procession of worshippers led by priests. Emerging from the easterly salient was another street (fig. 1) which ran in a north-westerly direction, leading to the gateway at that end. This was the river-side entrance and must have been used for bringing in produce from the satellite villages located up and down the stream.

As regards the Lower Town at Kalibangan, the important point is that it too was fortified. Thus, the suggestion thrown by some scholars that the elites living in the Citadel had fortified themselves against the commoners living in the Lower Town, so that the latter may not attack them in case of scarcity and pestilence (*Mate 1970*) does not seem to carry any weight. Indeed, the Lower Town at Mohenjo-Daro also seems to have been fortified, as indicated by the discovery of a very thick mud-brick wall at the south-western periphery (*Dales 1965*). Since no excavation has been done in the Lower Town at Harappa, nothing can be said about the existence of fortifications around it, but both Lothal and Surkotda clearly show that the Lower Town also lay within fortification-



Plate XIII. Kalibangan : house-blocks on either side of a street in the northern rhomb of the Citadel Harappan.

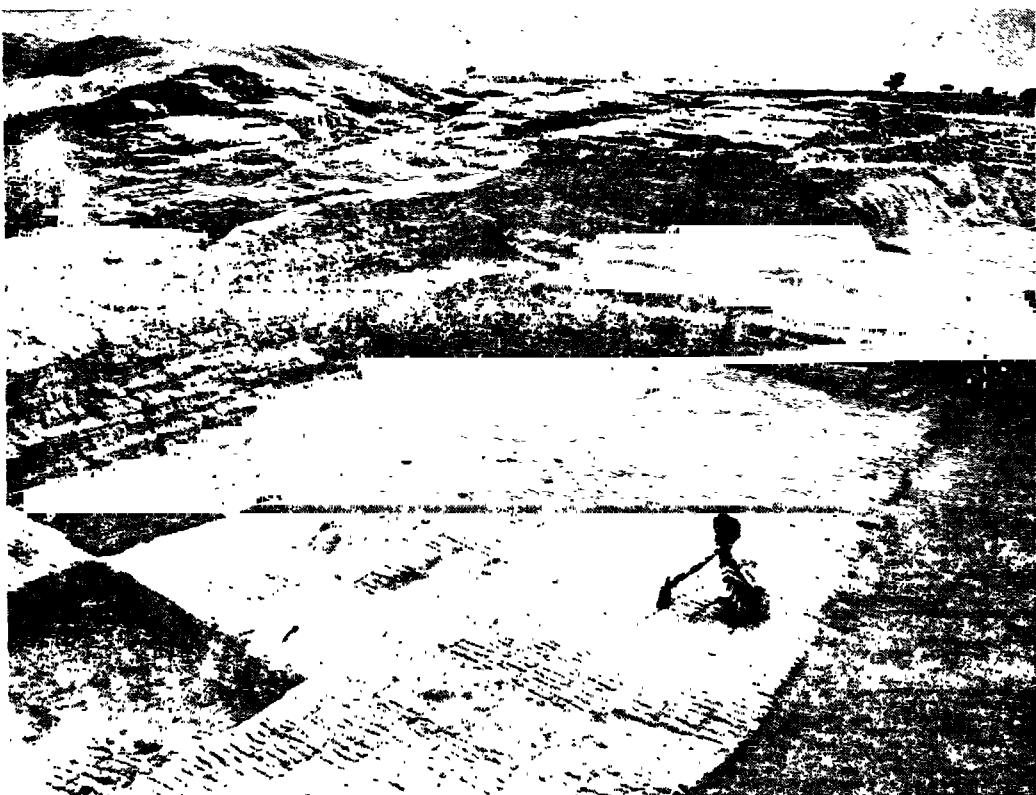


Plate XIV. Kalibangan : view showing the bipartite wall (left and its eastern salient (upper part) in the Citadel-complex. In the foreground are seen successive brick-on-edge pavements, Harappan.

walls, though the spatial inter-relationship between the Citadel and the Lower Town at these two places was slightly different. Since at Kalibangan no evidence of flood has been encountered, the theory that the platforms and fortification-walls were erected as measures against floods also does not seem to hold good. On balance, it would appear that Kalibangan fortifications were a response to the general concept of defences, which, as seen from the evidence at Kot Diji and at Kalibangan itself, was in full play even during the pre-Harappan times.

The fortification-walls at Kalibangan were duly identified on the western, northern and eastern sides. On the south, the wall had completely been eroded, but its one-time existence may safely be assumed. While the east-west distance across the Lower Town was 240 m., in respect of the north-south one all that can be said is it was more than 360 m. Three to four structural phases of the fortifications were noted, in the earlier of which mud-bricks of the bigger size ($40 \times 20 \times 10$ cm.) were used, but in the latter the size was only $30 \times 15 \times 7.5$ cm. May it, however, be added that the size of bricks used for the houses was all through $30 \times 15 \times 7.5$ cm., and that the defences were constructed right at the beginning of the Lower Town, along with the residential complex. The fortification-walls, as also the house-walls, were duly plastered with a mud-preparation.

Two gateways of the defences were identified, one on the western side, which com-

municated with the Citadel-complex, and the other in the north-west, being evidently a river-side approach (fig. 1). It is likely that there were corresponding openings on the east and south-east, but since the fortification-walls in the likely locations have completely been eroded, no affirmation can be obtained. The probable opening on the east may have communicated with the ritual complex identified in Mound KLB-3.

The township inside was planned in the standard Indus style. It had a grid-pattern of the streets, running north-south and east-west, one set cutting the other at right angles (*pl. XVI*). Of the north-south streets (*pls. XVII and XVIII*), four were noted to run all the way from the north to the south, while one was limited to the south-western part. It is likely that there was a corresponding (sixth) street in the north-eastern part, though owing to extensive erosion of this area it could not be confirmed.

Plate XV. Kalibangan : entrance stairway leading across the bipartite fortification-wall (left) into the southern rhomb of the Citadel Harappan.



In the east-west direction three streets were duly identified, while there were reasonable indications of a fourth one. In addition, a street was also identified on the inner side of the northern fortification-wall, which evidently provided a link for the north-south streets. Had this been not there, the latter streets would have met a dead-end in the fortification-wall. It may be surmised that there was a similar street along the inner side of the southern fortification-wall, but since the wall itself has been eroded, the surmise can only be regarded as a reasonable conjecture and nothing more.

The sense of proportion of the Harappans was indeed remarkable, for even in regard to the width of the streets it was operative. Thus, while the lanes measured 1.8 m., the streets were in its multiples, namely 3.6 m., 5.4 m. and 7.2 m. Since vehicular traffic moved along the wider streets, wooden fender-posts were provided at the exterior corners of the houses at the crossings. It may also be stressed that all through the occupation of the site, involving nearly ten metres of vertical deposits, no encroachment was made on the streets. The only structures that ever existed in the streets—and these had been put up consciously as a part of the overall plan—were small mud-brick platforms abutting the exterior of the houses. These may have been used for an evening gossip, as are used their counterparts in the present-day villages in the area.

An average Kalibangan house, following the Indus pattern, consisted of a courtyard surrounded on two or three sides by living rooms. Cooking was usually done in a sheltered corner in the courtyard. In it were also laid oblong troughs of mud-bricks in

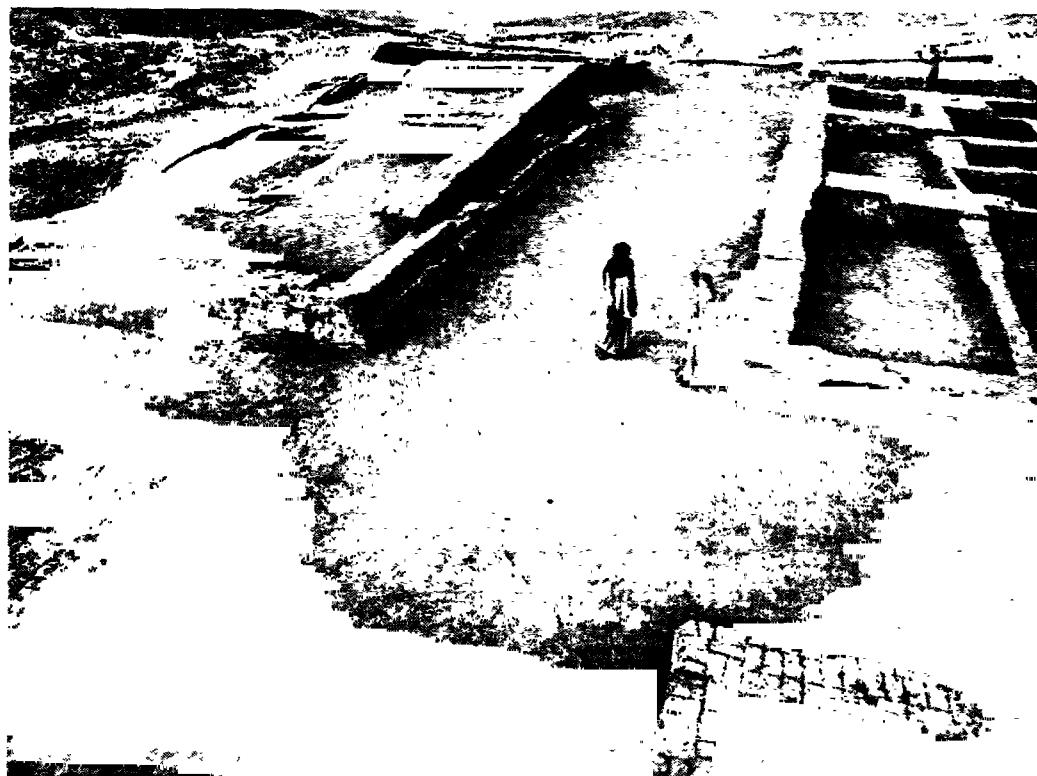


Plate XVI. Kalibangan : a road crossing in the Lower Town, Harappan.

which fodder was served to the cattle. In one of the courtyards was also observed a series of lower halves of jars embedded in the ground, in which probably water was served to the cattle. In many of the courtyards there occurred a brick-lined well from which drinking water must have been drawn. Rising from one of courtyards, alongside the exterior of a room, was a flight of mud-brick step which led either to an upper storey or to the terrace above the room. Evidence indicated that the house-roofs were flat, constructed with rafters and reeds overlain with rammed mud. The house-floors were either of rammed mud or paved with mud-bricks or (in one case) with tiles bearing decoration of incised intersecting circles (*pl. XIX*). In the later levels, however, an interesting device was used. It consisted of providing a soling of overburnt terracotta nodules interspersed with charcoal, over which a clay flooring was given. Engineers are of the view that the provision of such a soling must have prevented salt-petre from travelling up along the walls and also acted as a preventive against termites. If this view is correct, let us give the Kalibanganites full marks for their ingenuity!

Kiln-burnt bricks were used rarely in walls. Their main use lay in wells, bathing pavements and drains, that is to say in items where water-action was involved. In a few instances, their use was also noticed in door-sills. The doors, it appears, were single-leaved. The drains were localized and discharged into large jars or troughs embedded into the street immediately outside the house. It is to be assumed that the civic authori-

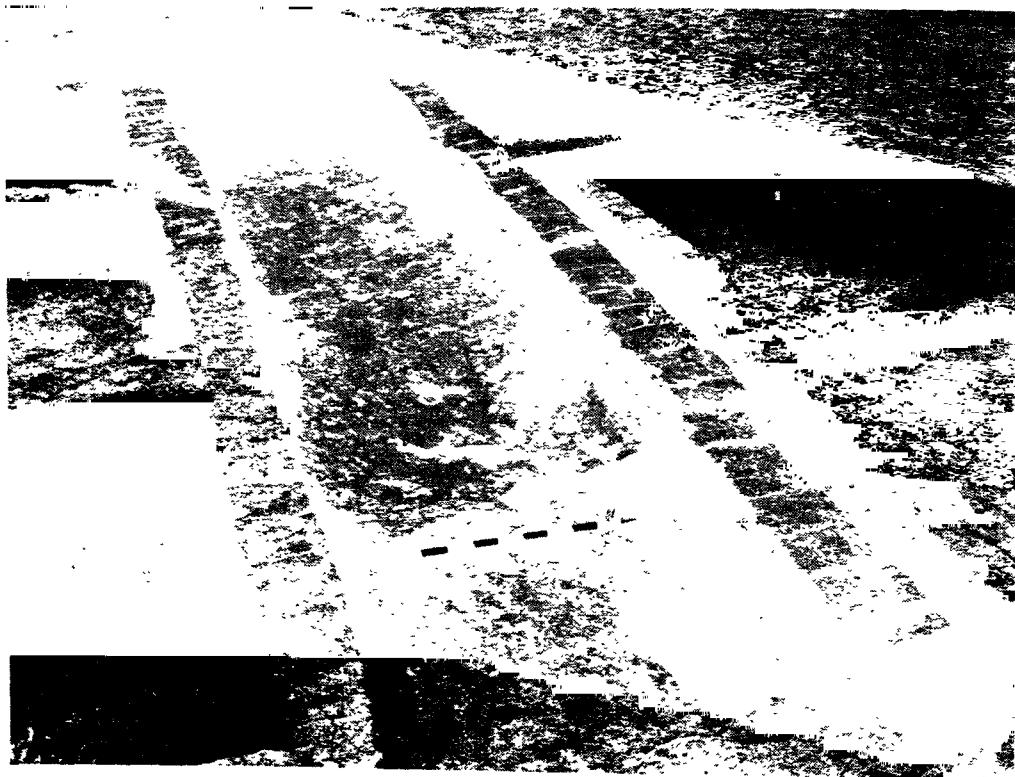


Plate XVII. Kalibangan : view of another north-south street in the Lower Town, Harappan.

ties took due care to have the sullage regularly removed.

Most of the rooms were used for living purposes, which include their use as bedrooms, but some also served as stores. In one of the rooms many large jars were found embedded in the ground. These seem to have been used for the storage of grains. It further appears that in almost every house a room was reserved for the 'fire-altars' which had their characteristic shape and other features including the central stele. In a few cases these were lined with mud-bricks.

While the people performed the rituals privately in their houses, they also joined hands in community rituals, as shown by the occurrence of a series of fire-altars on one of the platforms in the southern rhomb of the Citadel-complex. Besides, there was another area (KLB-3) which was used exclusively for fire-altars. It lay about 80 m. to the east of the Lower Town. Though this complex had largely been eroded, a large room with four to five altars was duly identified.

A question might reasonably be asked : Why another community ritual-complex, when there was already one in the Citadel area? The answer might perhaps lie in social stratification, that is while some privileged people performed the rituals in the Citadel-complex, the others used the unfortified and less ostentious place in KLB-3. Alternately, the KLB-3-complex may have come up at a time when the Citadel-complex was on the wane, towards the last days of Kalibangan. The point indeed needs further investigation but if the answer lay in the former alternative, it would be of great interest.

That there may have been some kind of social stratification amongst the Harappans seems to be reasonably indicated. A surmise has already been made above that in the northern rhomb of the Citadel-complex there lived the 'priests' who administered the rituals in the southern rhomb. Those who lived in the Lower Town belonged in all likelihood to the agriculturist and mercantile class. Then there were some more people living in

Plate XVIII. Kalibangan : a view of the north-south main street in the Lower Town Harappan.



an unfortified area to the south of the Citadel (cf. fig. 1). Although no excavation was done in this area (except to trace the alignment of the fortification-wall, which was not found), surface-indications are clear that it was occupied during the Harappan times. Towards the southern extremity of this area some pottery-dumps were also noted. It would appear that here probably lived the members of the working class. Such a surmise gets reinforced when one looks back at the planning of Harappa where 'within the shadow of the Citadel', immediately to its north, there were the working platforms and workmen's quarters. One may thus provisionally postulate a three-fold social stratification amongst the Harappans, although, of course, much more evidence would be necessary to establish it duly.

Whether some kind of social stratification is also reflected in the disposal of the dead at Kalibangan is again a matter of debate (*Gupta, 1977*). But the fact remains that three types of disposals did exist. One of these (called here Type I) was the usual method met with at Harappa itself and other Harappan sites. According to it, an oblong or rectangular pit, sufficiently long, wide and deep to accommodate the dead and concomitant grave-furniture, was dug into the ground. At the bottom of the pit was placed the dead body—extended, supine and oriented north-south, with the head towards the north (*pl. XX*). Pottery and some personal belongings like beads, sometimes a mirror, etc., were placed mainly in the head-region of the grave but in other parts as well. The pit was then filled up with the self-same earth. In one case, the grave-pit was found lined with mud-bricks which were also plastered. It is just possible that a small mud-brick tumulus was also put up over the grave to mark it out, although subsequent erosion has left no trace of it. Such a tumulus was, of course, observed at Harappa (*Wheeler, 1947, pl. XXXVIIIA*). Among these inhumation graves was one in which the body lay prone instead of supine. Also, the head was towards the south, and the legs were crouched. Although there was only one example of the kind, nevertheless one has to take a note of it.

The other two types of 'burials' were indeed without the dead. But since they occur in the cemetery area as a whole and contain grave-furniture more or less in the same manner as do the inhumation graves, it is only reasonable to regard them as connected with the dead. Of these, Type II was in the form of an oblong pit of approximately the same dimensions as in the case of Type I. On the pit-floor were kept a large number of pots and other grave-furniture, again like those in Type I, but there was no dead body. A noteworthy feature, however, was that the pit was not immediately refilled but allowed to remain open for some time. This is shown by the occurrence of bands of clay and



Plate XIX. Kalibangan : a room in the Lower Town, showing tile-flooring with the typical intersecting-circle design; Harappan.

sand (*pl. XXI*), which evidently got accumulated during the exposure. These bands were a recurrent feature of all the examples of Type II. Another point to be noted is that the graves of Type II were interspersed with those of Type I. Whether the former represent some kind of a ritual connected with those buried in Type I, or whether they relate to some people who had died elsewhere and their graves were put up here only symbolically, or whether they relate to a social category of people who disposed of the dead in some other manner but put up 'graves' for them just copying those of Type I—are matters which deserve further examination.

Graves of Type III (*pl. XXII*) also raise similar questions, since these too did not contain any skeletal remains. However, they differed to a certain extent from those of Type II. First, they were located in a somewhat detached area, to the north of that containing graves of Type I. Secondly, the pit in the case of Type III was circular or nearly so. Thirdly, in each grave of this type there was a large urn which was perhaps the main piece. Around it were placed the other pots and grave-furniture including beads and, in one case, a mirror. It was expected that the urn might contain bones or ashes, but nothing of the kind turned up.

Above, social stratification and some other alternatives have been envisaged while trying to understand these variations. To these may perhaps be added another, *viz.* that



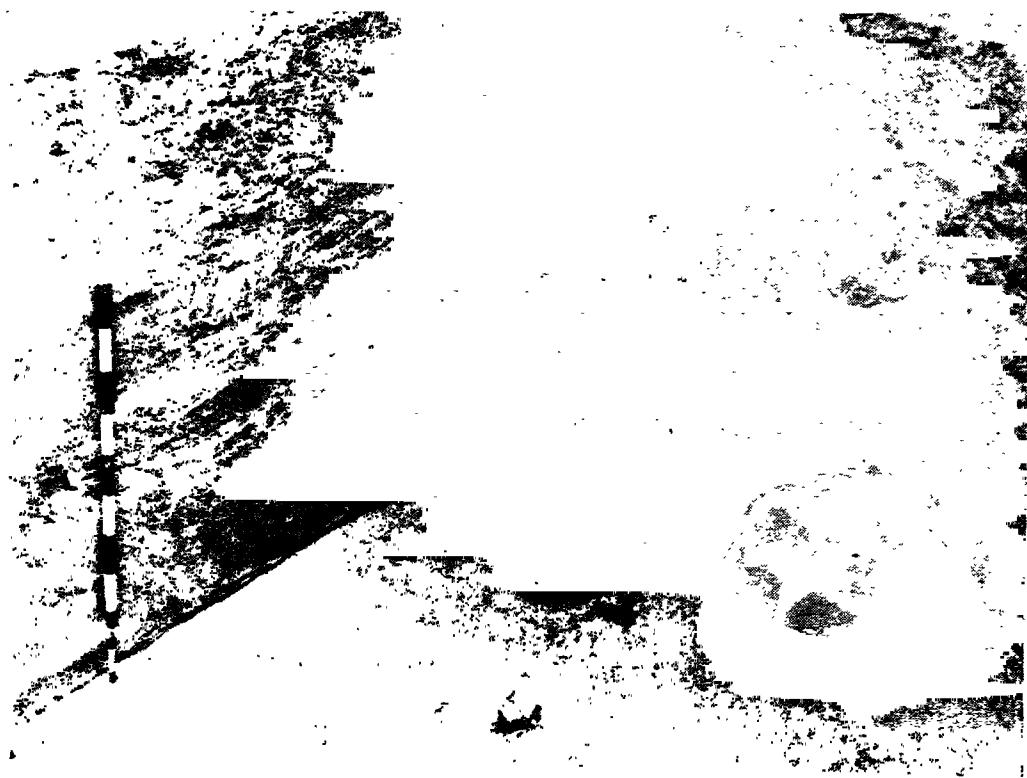
Plate XX. Kalibangan : extended burial in a Type I grave, Harappan.

of time. But all these must necessarily remain conjectures for the time being.

Although the skeletal material has not yet been studied in detail, some interesting side-lights are none-the-less available. Thus, the skull of a child was found to be unusually big. It was evidently a case of hydrocephaly, resulting from excessive accumulation of water in the brain-cells. This must have given the child terrible headache. To relieve the patient of it, the Kalibangan doctor pierced the right temporal region with three holes and also did some branding with a heated instrument. Trephination, as a kind of primitive treatment for headaches, is known from other ancient sites in India (e.g.) Lothal and Burzahom, (*Rao 1973, pp. 149-50*) and abroad.

In the case of a male skeleton, a sharp cut was observed near the left knee. The size of the cut incidentally corresponds to that of the blade of an average copper axe of Period II. One is thus tempted to visualize a feud in which this person was struck down with an axe and, owing to excessive bleeding, succumbed to the injury.

The pottery and other finds from Period II are all typically Harappan. In the lower levels, however, some pottery of the pre-Harappan type was also found alongside the Harappan, the probable implication of which has already been considered above. Among the Harappans pots, a feeding cup with the head of a cow on the rim (*pl. XXIII*) is particularly charming, as it shows delicate imagination on the part of the potter.



Grave No. 30.

Plate XXI. Kalibangan : part of the pit of a Type II grave, showing pottery-deposit overlain with subsequent bands of clay and sand, Harappan.

The terracotta objects included toy-cart frames and wheels, rattles, birds, animals, gamesman, etc.—all familiar in the Harappan context. However, specially noteworthy were : a human head (*pl. XXIV*) which, though tiny, was very expressive, and resembled the head of the famous lime-stone priest from Mohenjo-Daro; and a bull, very vigorous and in a charging mood (*pl. XXV*), which, again, was more than a match to its counterpart from that site. Incidentally, a bull in copper has also to be noted for its excellent modelling and expression. Continuing with the terracottas, it may be observed that the mother goddess figurines, so familiar at Mohenjo-Daro and Harappa, were conspicuous by their absence at Kalibangan.

The personal and toilet objects included beads and bangles of various materials, ivory combs and copper mirrors and pins.

As already stated earlier, a sizable section of the population must have engaged itself in agriculture, trade and commerce. Amongst the crops produced, those of wheat and barley may be noted; but rice seems to have been unknown. Long blades of chert, mounted on wooden handles, must have been used for harvesting. Since the pre-Harappans did not use chert and this material is also not locally available, it is evident that the Harappans introduced it to Kalibangan and continued to obtain it from their earlier



Burial No. 6

Plate. XXII. Kalibangan : 'pot-burial' (Type III grave), Harappan.

home in Sind where it is known to occur. But for these blades, the tools were made of copper and included chisels, axes, and the like. Of the same metal, arrow-heads and spear-heads were also encountered. It is interesting to note that unlike at Mohenjo-Daro and Harappa, at Kalibangan no attempt seems to have been made (as evidenced by the nearly twenty specimens examined) deliberately to add tin to copper to produce bronze. The small quantities of tin present in a few of the specimens are to be regarded as impurities in the ore.

That the Harappans of Kalibangan were engaged on trade and commerce is fully vouchsafed by the occurrence of weights and measures and seals and sealings—all of which, may it be noted, were conspicuous by their absence during Period I of the site. Thus, the weights were the usual cubes of chert, while in regard to measuring instruments, particular attention may be drawn to terracotta graduated scale. Of the sealings, four views of one example are illustrated on *pl. XXVI*. These show the impressions of : reeds, a knotted cord and perhaps two seals. The sealing substance is clay. All this shows how the seals are likely to have been used. The commodity in this case was placed in a package of reeds, which was tied with a cord, and over its knot was placed clay which was stamped with seals. This is what is done even now, though the package may be of wood instead of reeds and the sealing material may be wax in place of clay. Amongst the seals, which are mostly of steatite, two are noteworthy because of the themes depicted on them. In one



Plate XXIII. Kalibangan : terracotta feeding cup with cow's head on the rim, Harappan.



Plate XXIV. Kalibangan : terracotta human head, Harappan.

That writing was not limited to only seals and sealings is very clear. It was more commonly known and used, showing a fair degree of literacy. Thus, what are probably the owners' names occur not only on the more valuable objects like axes, but also on the very common ones like pots. The practice of inscribing names on pots has been a feature during the early historical times and is there even now.

On two such pots the inscription has been of immense help in settling once for all the question relating to the direction of writing in the Indus script. In the example illustrated on *pl. XXVIII* three signs are clearly discernible. Of these, the second sign from the right consists of three components : a sign resembling the letter 'I' of the Roman alphabet in its scriptal form; four oblique strokes cutting the 'I' and an 'angle' with its apex upwards. It would further be noted that the left-hand end of the 'I' is overridden by the lower end of the right arm of the 'angle'. Again, the lower end

case, the so-called unicorn (which in fact has two horns) has been shown in three postures, though the hind part of the body remains the same. Thus, the animal turns its neck and looks backwards, raises the neck and looks upwards, and lowers the neck and looks downwards. In the other seal, a tiger turns its head backwards and looks at a human figure (or a deity?) seated on a tree. Both the seals have parallels from Mohenjo-Daro, but the themes are nevertheless of very restricted occurrence. There is another seal which calls for special attention. It is cylindrical (*pl. XXVII*) and, therefore, not of the usual Indus type. The scene depicted on it is also unusual and here one is tempted to surmise that, since cylinder-seals were common in contemporary Mesopotamia, the person who owned this seal was a trader, or at least a local representative of a trader, from that land, who was sending packages home after putting this seal.



Plate XXV. Kalibangan terracotta bull, Harappan.

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Plate XXV. Kalibangan terracotta bull, Harappan.



Plate XXVI. Kalibangan : four views of a terracotta sealing, showing impressions of reeds, knotted thread and seals, Harappan.

Plate XXVII. Kalibangan : Cylinder seal, with its impression, Harappan.

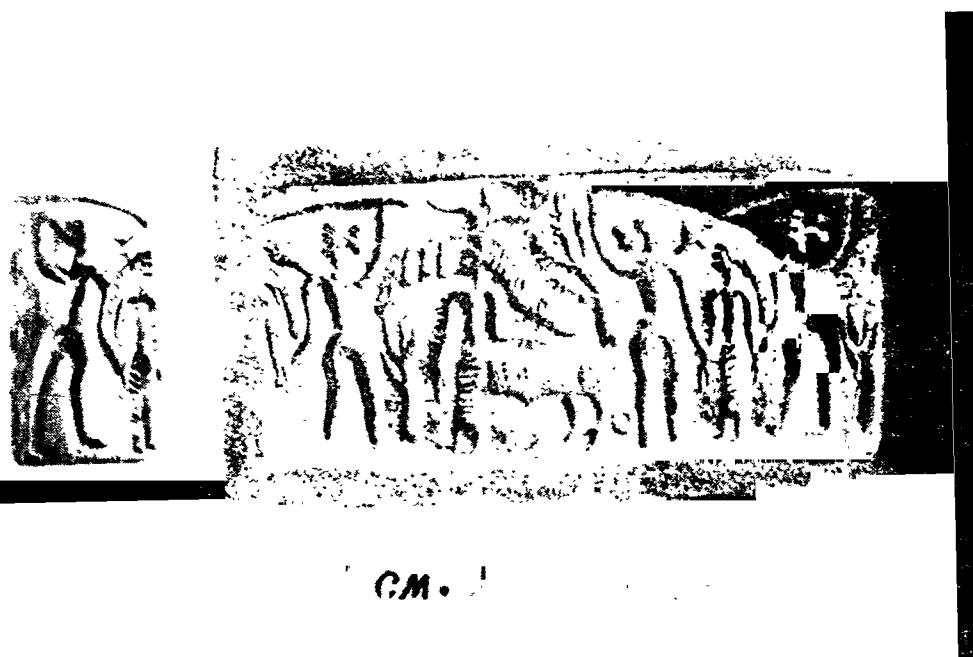




Plate XXVIII. Kalibangan : inscribed potshered with overlap of letters, showing that the direction of writing in the Harappan script was from the right to the left.

earthen dam across the Indus some way downstream from Mohenjo-Daro, as a result of which the rising waters of the river engulfed the city and brought about its end. Both the hypotheses are not free from their weaknesses, but this is not the place to go into them. However, in so far as Kalibangan is concerned, neither of these theories could possibly apply. There was no massacre nor was there any evidence of destruction of the site through floods. But if Indra must still be invoked, he may be brought in for having withdrawn the water-supply. To put it plainly, evidence suggests that the drying up of the Ghaggar may have been responsible for the desertion of the Harappan settlement at Kalibangan. Geomorphological and geological studies have shown that during the protohistoric and early historical times the Ghaggar dried up on several occasions (*Raikes, 1968*), and it must have been under one such dry spell that the Harappans had to give up Kalibangan. Perhaps this may also have been the cause of their moving eastwards into the upper Gāṅga-Yamunā *doab*, where sites like Alamgirpur came into being.

When did it all happen? For an answer one has to fall back upon the ^{14}C dates, though it must be emphasized that their blind acceptance can lead to very anomalous results. For example, two of the dates from the Late Phase of Period II at Kalibangan would make us believe that the Harappan occupation continued up to the thirteenth century B.C. (The concerned dates, based on 5730 half-life, are 1390 ± 95 B.C. and 1215 ± 105 B.C., the Laboratory numbers being TF-244 and TF-138 respectively.) Likewise, one of the samples (TF-240) would place even the Early Phase of Period I (pre-Harappan) at 1765 ± 115 B.C., whereas the dates for the beginning of Period II (Harappan) are 2230 ± 105 B.C. (TF-160) and 2090 ± 125 B.C. (TF-607).

of the left arm of the 'angle' is overridden by the right-hand vertical line of the 'V'-like sign on the extreme left. The other example, referred to above but not illustrated, also shows a similar behaviour of the signs. These examples clearly prove that the direction of writing in the Indus script was from the right to the left. (For greater details cf. *Lal, 1966*). In examples where a second line existed the direction was boustrophedon.

The End, Chronology and Origin

What brought about the end of the Indus Civilization has been a matter of debate. Some ascribe it to Indra as symbolic of the Aryans invaders, while others again seem to think of Indra, the rain-god, whose wrath flooded some of the sites. Thus, Wheeler (1947) basing his theory on the presence of some skeletons in the upper levels of Mohenjo-Daro, thought that the Mohenjo-Darians were massacred by the invading Aryans. Raikes (1965) invoked the theory of a tectonic movement which threw up

However, a judicious assessment of all the ^{14}C dates put together leads us to the conclusion that the Harappan settlement at Kalibangan may have come to an end around 1700 B.C. The concerned dates are 1665 ± 110 B.C. (TF-143) and 1765 ± 105 B.C. (TF=946). But these are 'uncorrected', and if we take into account the MASCA correction (*Ralph et al., 1973*) or the one suggested by Clark (1975), the corresponding figures for 1665 B.C. would be 2040 B.C. and 1910 B.C., and for 1765 B.C., 2110 and 2040 B.C. According to these corrections, therefore, a date around 2000 B.C. would work out for the end of the Harappan settlement at Kalibangan.

As to its beginning, a date around 2200 B.C. is indicated by the two samples (TF-160 and TF-607) already referred to above. However, when MASCA and Clark's corrections are taken into account, the corresponding dates for 2230 B.C. (TF-160) would be 2350-2460 B.C. and 2680 B.C., and for 2090 B.C. (TF-607), 2545 B.C. and 2500 B.C. Alltold, these corrections would indicate *circa* 2500 B.C. for the commencement of the Harappan settlement at Kalibangan.

As already indicated above, some of ^{14}C dates for Period I (pre-Harappan) are very late when one takes cognizance of the fact that there was a clear break of occupation between Periods I and II. With this break, and with an occupational deposit of 1.6 m., the beginning of Period I is likely to be at least 200 years earlier than that of Period II. And this is what is also indicated by the earliest available date for the Early Phase of Period I : it is 2370 ± 120 B.C. (TF-155). 'Uncorrected', it would place the beginning of Period I to about 2400 B.C. When corrected according to MASCA and Clark, the corresponding figures for 2370 B.C. would be 2920-2940 B.C. and 2905 B.C. respectively, i.e. around 2900 B.C.

To sum up, the dating of the two Periods at Kalibangan would be as follows :

<i>Period</i>	<i>Based on uncorrected ^{14}C dates</i>	<i>Based on corrected ^{14}C dates</i>
II (Harappan)	2200-1700 B.C.	2500-2000 B.C.
I (Pre-Harappan)	2400-2250 B.C.	2900-2700 B.C.

At the end, one might like to ask : What was the relationship between the cultures represented by Periods I and II respectively? Do they represent two altogether alien cultures, or are they traceable back to a common stock? If the latter hypothesis is somewhere near the truth, how does one explain certain qualitative differences between the cultural equipment of the two Periods?

That the cultures represented by these two Periods are not alien, in the way, for example, the Harappa Culture and the North-Western Neolithic Culture are, will easily be conceded. But how far and in what manner are the two inter-related remains to be examined in great detail. Meanwhile, some salient points may be noted here.

In the first place, let the Period I culture at Kalibangan be viewed in the context of other stratigraphically pre-Harappan cultures. These are, for instance, the ones identified as Amri IC-IIIB (*Casal, 1964*), Gumla II-III (*Dani, 1970-71*), Harappa I (pre-defence) (*Wheeler, 1947*), Kot Diji I (*Khan, 1965*) and Mitathal I (*Suraj Bhan, 1975*). The cultures known as Jajilpur II (*Mughal, 1974*) and Sarai Khola II (*Halim, 1972*) are also comparable with the foregoing, though these two sites have not yielded any superimposed Harappan remains. It would thus be seen that these Pre-Harappan cultures occupied almost as wide an area as did the Harappa Culture itself.

All these cultures represent a chalcolithic stage which may as well be regarded as

the 'Copper/Bronze Age' in the making: blades of agate, chalcedony and, in some cases, chert were no doubt used, but the mesolithic stage had long been crossed; besides, exploitation of metal for making ornaments, tools and weapons had not only taken place but was also progressively on the increase. Thus, at least on these counts, the difference between the pre-Harappan cultures and the Harappa Culture was more quantitative than qualitative: the Harappans also used stone (chert) blades, though the use of copper/bronze was comparatively more in their case than in that of their predecessors.

The pre-Harappans of Kalibangan used standardized bricks in English bond, oriented their houses along the cardinal directions, appear to have had some town-planning (though not much area was excavated) and, above all, had a fortification around their settlement. Kot Dijians, who even used bricks of the typical Harappan proportions (4:2:1), also did not lag behind in regard to fortification. Similar evidence is available at many other pre-Harappan sites. And, indeed, this was no mean achievement, as it reflects organized community life and some kind of civic administration.

If we look at the pottery and other antiquities used by the pre-Harappans, we find that these were not basically different from those of the Harappans. For example, while Fabric A of Kalibangan I was distinctly non-Harappan, the other Fabrics, particularly C and E, were quite akin to the Harappan. And so were many of the shapes, for example the flanged jar (fig. 4:3), lid (fig. 4:5), dish-on-stand (fig. 4:7-8), cup-on-stand, (fig. 3:4-5; fig. 4:6) etc. Even some typical Harappan painted motifs, e.g. the fish-scale, intersecting circles, pipal-leaf and banana-plant, had come into being during the pre-Harappan times. (Evidence from Kalibangan, Kot Diji, Jalilpur and Sarai Khola.) Amongst the terracotta objects, the toy carts and 'cakes', the latter in particular (from Kot Diji and Jalilpur), are to be noted. The characteristic disc-shaped beads of steatite, as also the beads of lapis lazuli were evidently passed on to the Harappans by their predecessors.

But the pre-Harappans do not seem to have had any weights and measures nor the remarkable seals and sealings. And here lay the crucial qualitative difference which, at the same time, explains the *raison d'être* of the Indus Civilization. The pre-Harappans had their well laid-out fortified towns and were also very well up in agriculture, as attested to by the ploughed field at Kalibangan. In other words, they had developed a social and civic organization to deal with the problems of the community, and were standing on the spring-board to jump into a large-scale agricultural surplus which would be able to sustain specialized craftsmen, technicians and artists. Riverine as well as land-trade were already there (otherwise, how could lapis lazuli be obtained from Afghanistan?), though perhaps on a small scale. The stage had thus already been set for an outburst from small-scale trade to large-scale one, and from village-cum-town-life to city-life. And this is exactly what seems to have happened. Large-scale trade and commerce necessitated the introduction of weights and measures and of accounting, the latter of which could not be done without a system of writing. The commodities had to be packed and sealed: hence the birth of the seals. (Elsewhere, Lal 1975, it has been indicated that the seeds of the Harappan script also might have been sown during the pre-Harappan times.)

In an overall assessment, therefore, it would appear that the so-called pre-Harappans may, indeed, be proto-Harappans—the forefathers of the Indus Civilization. The birth evidently did not take place at Kalibangan, but most probably in southern Punjab or northern Sind. Let the spade give the final verdict : the unfathomed levels of Mohenjo-Daro are crying for it!

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Amri : An Introduction to the History of the Indus Civilization

J.M. CASAL

NOBODY HAD forgotten the survey undertaken by N.G. Majumdar in Sind in 1929 (*Majumdar 1934*) and the trial trenches he had dug into the smaller mound of Amri (District Dadu, Sind). Death prevented him from more extensive excavations. Nevertheless his sondages had for the first time revealed under Harappan layers the remains of an older culture which was since named 'Amri Culture', but besides a few potsherds which up to that time had been said to belong to a category called by Aurel Stein 'hybrid wares', not much was known of that culture.

This is why we undertook in 1959 new excavations which were to last up to 1962. During that period trenches were carried not only on the lower mound of the site previously explored by Majumdar and named by us Mound B, but on the higher one (Mound A) hitherto unexcavated.

The spade-work revealed that occupation at Amri had been of a long duration and a number of periods and sub-periods could be defined (see Chart).

Period I (with sub-periods A, B, C, and D) was discovered on both mounds but only the last two sub-periods IC and ID had been represented on the lower mound (Mound B) excavated by Majumdar so that the older phases IA and IB had escaped him. The whole of Period I is purely Amrian.

Period II, with two sub-divisions IIA and II B, was an intermediate one, still having elements inherited from Period I, but already yielding samples characteristic of Period III.

Period III may be in the main considered as representative of the Indus Civilization. It is sub-divided into four sub-periods as follows : Sub-period IIIA, found on Mound B only where it succeeds without any break period IIIB should, according to the old terminology be considered as 'mature Harappan'. Sub-period III B represented on Mound A by many layers and two structural levels could have been taken under the same label. It is characterized by its pottery which is found on many sites of the Indus Civilization and namely at Harappa itself (*Vats, 1943*).

Sub-period IIIC still contains many elements of the two preceding ones but the proportions of various types are often different. Besides, a new kind of pottery appears which is not represented at Harappa itself, but sherds of which have been discovered in

PERIODS	location of levels	
	east mound A	west mound B
	surface	
▽ HISTORICAL	B A	
		abandonment
IV JHANGAR		hatched
III indus civilization	jhukar mohenjo daro (upper levels) transition mature (harappan)	D C B A
		surface abandonment
II INTERMEDIATE		abandonment
I AMRI CIVILIZATION		V.S.
		V.S.

Chart I. Diagram of Occupations at Amri.

the upper levels of Mohenjo-Daro and at many other places in Sind.

Sub-period III D may be said to represent the 'Jhukar Culture'. No pure layers nor plans of that time have been recovered, but so many sherds of that culture have been found that they cannot be considered just as picnic cookery. Levels of that time must have existed on Mound A, but they apparently were much later destroyed by the builders of Period V. All the specimens of that pottery indeed come from debris layers shovelled aside in order to level the top of the mound and prepare it before the last buildings were erected in the Islamic times. As we shall see, sub-period III D no doubt follows immediately the preceding sub-period.

Period IV has to be mentioned, if only for memory. Its traces were found in the same debris as the Jhukar pottery. The wares corresponding to it are clearly of Jhangar style. Though not numerous, they are witnesses to an occupation of the Jhangar Culture, but typically nothing makes it possible to link it with the previous occupations, nor to date it securely. From the experience gained at Pirak in the last few seasons it is only possible to suggest that the Jhangar Culture and its pottery show some affinity with a few sherds, black or grey, sometimes incised, from the upper levels at Pirak ; if so that Jhangar occupation should have taken place after a long desertion and could be roughly dated to the middle of the first millennium B.C.

As for Period V, it clearly lies outside the scope of this article, belonging, as has been mentioned above to the Islamic times.

This review of the successive occupations of the mounds at Amri leads us to stress a few points of importance :

- (1) the long duration of the Amri occupation and its antiquity ;
- (2) the evolution of the material aspects of the Indus Civilization at Amri and its consequences in the chronological order of the many sites of the same civilization in Sind and elsewhere.

I

The first period which is fully Amrian is made of nine superimposed structural levels and the most noticeable link with sequences noted elsewhere is the presence in Period I A and B of concentric rows of radiating hooks which are characteristic of Togau C. As for designs typical of Togau D they are found for the first time in Amri IB, but are more numerous in Amri C and D.

Majumdar had already stressed the bichromy in the decoration as a peculiarity of the Amri style of pot painting. As a matter of fact, that characteristic is always present at Amri from the beginning up to the end of Period I with extension in Period II. This trait may have its origin in permanent connections with Baluchistan where bichromy and polychromy are in favour in many local cultures. The pottery of Amri had been described by Majumdar as formed mostly of wheel-turned, rimless vessels decorated in black by a zone of geometrical designs with plum-red bands above and below on a buff background.

The description is valid for the wares of Period IC and D which were the only phases represented on Mound B. Such a pottery shows in fact a faint similarity with bichrome wares such as that of Kechi-Beg. But the connection seems to have been overrated. The Amrian wares of Period IC, ID and II more likely originated in the bichrome

wares of Amri IA and IB which are somewhat different. That pottery usually is handmade, with a brick-red or beige background on which geometrical designs are painted with a thick brush in black, and often with plum-red fillings. The classical Amrian pottery as described by Majumdar appears with a small number of vessels in IB where it represents no more than 4 per cent of the total. The rough handmade pottery there seems to be ancestral to the classical Amrian ware which from IB is found up to the end of IIB in increasing numbers. As had been noted in the final report on Amri excavations, typical similarities with Iran make it improbable that the oldest layers at Amri could be earlier than the Jemdet-Nasr Period of the Near-East (*Casal, 1964, I, p. 56*). But, since that publication, new elements for an absolute chronology came to light : two samples of charcoal have been tested by the Tata Institute of Fundamental Research, Bombay, with results as follows :

TF-864 from Amri IB	4710 ± 110	(4850 ± 115) B.P.
TF-863 from Amri IC	4485 ± 110	(4615 ± 110) B.P.

With the 5730 years half-period those two sub-periods would be included in the time limits of 3015 to 2450 B.C., which roughly confirms the result obtained by the comparative study of the material. If MASCA correction factors are added, we should then come to brackets enclosing a period from c 3700 to 3000 B.C., but these corrected dates are still open to discussion pending a general agreement of the archaeologists of the Near-East on such changes. Nevertheless there is a general concordance of the figures given for the Amri I B-C levels with those of Mundigak I, 2-3 which with MASCA factors added should come between 3900 and 3700 B.C. The only objection could be that Mundigak I, 3 yielded Togau A sherds and Amri IB Togau C sherds, which leaves a rather short time for the evolution from Togau A to C.

That correspondence between the early levels at Amri and Togau C is important for the fact that the few sites yielding Togau C pottery in Sind may be considered as the most ancient ; such is the case for Lohri, Ghazi-Shah and Pandi-Wahi the occupations of which seem to be parallel to those of Amri.

II

If we now turn to the Indus Culture at Amri, we first have to state that its characteristic pottery appears with a very few sherds at the end of Period I. The layers of Period ID yielded indeed a few fragments which, either for the decoration or for the shape are identical to shapes and decoration well known on all sites of the Indus Valley Civilization (see Amri No. 214 for the decoration and No. 217 for the shape*). Though traditional wares of the Amri Culture still survive all along Period II with their own evolution, it is evident that the first samples of the Indus Civilization are just trickling in from outside and they are to become more and more numerous through all levels of Period II which may be accordingly termed as 'intermediate'.

What makes the individuality of Period III is that from its very beginning (IIIA) the traditional pottery of Amri type completely disappears, and only vessels of the Indus Civilization are in use (fig. 1).

*Mentions in parentheses of Amri numbers refer to the number of drawings in vol. II of "Fouilles d'Amri" Paris 1964 by the present writer.

AMRI		MOHENJO - DARO	HARAPPA	CHANHU - DARO
III B				
III A				
Fig. 1 ●				

Fig. 1. Evolution of the painted decoration at Amri during period III and correspondences with other sites

AMRI		MOHENJO - DARO	HARAPPA	CHANHU - DARO
				
III D				
		abandon		
				
				
				
				(J MUKAR)
III E				
				abandon

Fig. 1 . Evolution of the painted decoration at Amri during Period III and correspondences with other sites.

Contrary to the older reports of excavations at Mohenjo-Daro, a careful study of the finds, layer by layer, made it possible for the first time to distinguish several stages of evolution in the Indus Valley. During the first sub-period (Amri III A), the vessels collected, most of them decorated, have a polished bright red slip on which the various patterns are painted black. Shapes and decoration have strong analogies with a number of samples labelled at Mohenjo-Daro as coming from the 'lower levels' and they are very similar to the pottery collected at Chanhudaro in Period I (Harappan). The identity of the painted decoration at Amri and Chanhudaro is striking. Among the motifs can be noted not only that of the intersecting circles which was already present in Amri IIB, but also naturalistic patterns such as peacocks, fishes. It must be stressed here that such patterns, which have been often found at Mohenjo-Daro, Chanhudaro (*Mackay 1943*) and other minor sites in Sind were never discovered at Harappa in the same free style of painting with one single exception, a sherd from the defences (*Wheeler, 1947, Fig. 10, 38*). Let us finally note that during that sub-period, though a few high pedestalled dishes on stand were recovered, nearly all dishes on stand of Amri IIIA are squat ones, with the cup resting on a short and broad foot (fig. 2, 1)

With the second sub-period (Amri III B) changes happen. Many elements such as the intersecting circles are still there, but two tendencies appear in opposite directions. The first one goes towards more simplicity. Sometimes the decoration is made only of simple horizontal lines inside open vessels (*Amri Nos. 346-52*), or of wavy lines (*Amri Nos. 347-48*). The same plain bands are also found on the outside of pots (*Amri No. 358*). But as regards naturalistic designs, the patterns found at Amri consist mostly of foliage, but instead of being painted in the rash free style of Period IIIA, they are rather more elaborate, and executed in a painstaking fashion with a much thinner brush. As usual the slip is red and polished, but the colour is somewhat brighter.

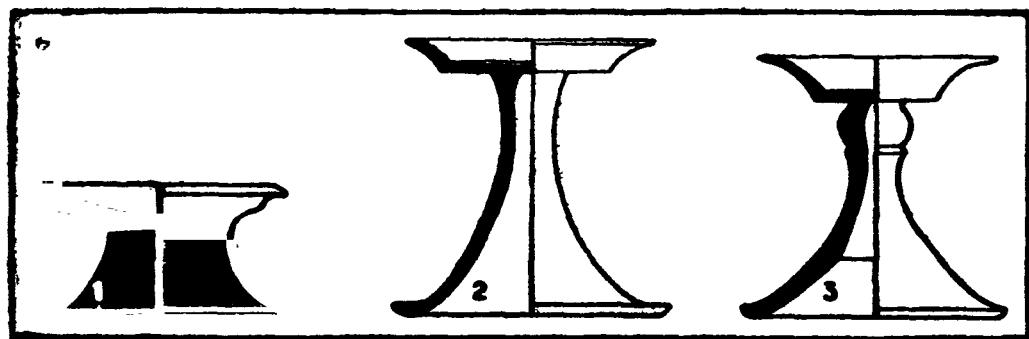


Fig. 2. Evolution of the dish on stand in the Indus Civilization.

As regards typical forms, one has to note that, contrary to the squat dish-on-stand of Period III A, the shape now mostly in use is that of a high pedestalled dish-on-stand (Fig. 2, 2). Furthermore, a new type appears with only a few specimens in III B, but it will increase in number during Period III C to the detriment of the simple high pedestalled one. It has a high stem too, but the shaft, instead of being plain, is adorned by a kind of swelling in the upper third (Fig. 2, 3).

Parallel to that evolution of the dish-on-stand, another shape shows its own changes through the four sub-periods of Period III. I mean here the rim of bowls and basins. During

III A most basins and dishes-on-stand have a nail-head section (*Fig. 3, 1*). With sub-period B, the slightly everted bowl rim (*Amri No. 345*) makes its appearance and already represents 25 per cent of the total of the pottery (*Fig. 3, 2*). This proportion climbs to 28 per cent during III C. In the meanwhile, larger basins show a similar rim projecting outwards (*Amri Nos. 372-75 & fig. 3, 3*). Let us mention too that, such oblong jars as Nos. 360 and 361 of Amri, very similar to type XLI of Harappa (*Wheeler, 1947*) are at Amri confined to sub-period III B (*fig. 1*). As regards decoration such a common motif as the intersecting circles has been delineated in the course of time according to different methods (*J. Dumarcay, 1966*).

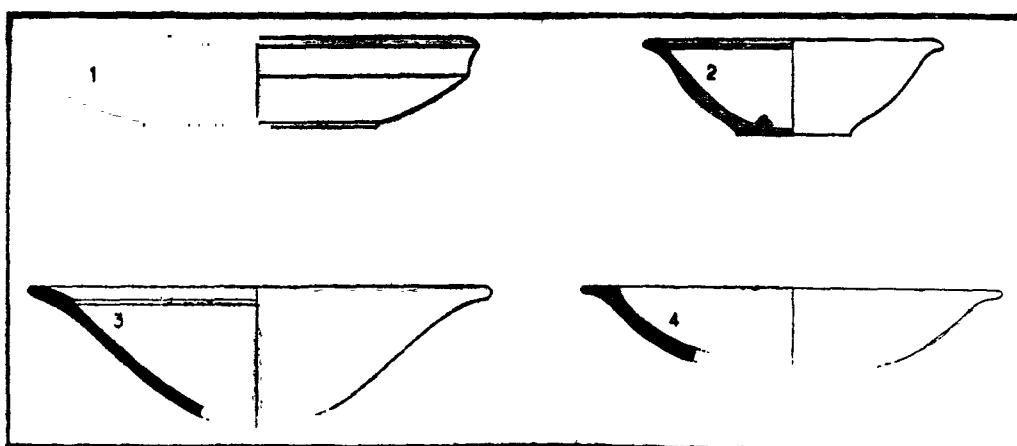


Fig. 3. Evolution of the rim of open vessels in the Indus Civilization.

As for Amri III C, though many samples of vessels painted in black on red still occur, two new trends must be noted: (a) very often the background instead of being red is rather of a light brown, chocolate shade, and it is usually decorated with motifs painted in black or violet-black ; the brush used is a thick one giving heavy outlines. Among the most usual is a kind of cog-wheel (*Amri No. 380*), and a series of ovals striped inside, looking like a chain. There are a few naturalistic designs too and among them a kind of palm-tree with striped leaves. Associated with these motifs of decoration one can notice the very frequent use of small barbed circles with a dot inside (*Amri Nos. 377-78-80*). There are very often on the inner rim of basins or on the foot of offering stands multiple garlands ; (b) a second category is marked by a dull unpolished background, either pinkish or purplish blue, or sometimes light red background with patterns painted black or violet. Decoration there is rather geometrical and of an artless sort: groups of parallel lines, vertical or slanting, with dots, dotted circles, or barbed dots between the groups of parallel lines (*Amri Nos. 400a-404-17-20 etc.*).

Besides these two important groups of pottery let us stress here that a few specimens (mostly on chocolate slip) of animal representations—some of them leaping kids—are very vivid and suggest a foreign influence (*Amri No. 452*).

Two points more have to be noted here : first that Amri III C is the only sub-period which yielded specimens of the well-known 'Indus goblet' ; second that Amri III C gave

a few specimens of what is usually considered as belonging to the Jhukar Culture at Chanhу-Daro and Jhukar itself (for instance *Amri Nos. 408-09*).

As had been mentioned above, sub-period D (*Amri IID*) is represented by a number of sherds found in a layer of debris shovelled away by the builders who levelled the top of the mound in order to erect, after centuries of abandonment, the small fort of the Islamic period, i.e. Period V.

The Jhukar Culture is represented in that layer by such a number of potsherds that their presence cannot be fortuitous. They must represent a time which comes without any break immediately after III C. As already noted, a few decorative patterns classified elsewhere as Jhukar were already present in Amri III C, showing the continuity of both sub-periods, but other evolutive processes can be stressed. Such is the evolution of the small tree with big leaves drawn with a thick outline and hatched filling. A simplified type of it can already be found in III C (*Amri No. 448*) and again in III D (*Amri Nos. 501 and 518*).

In the same way (*fig. 3, 4*) the rim of the basins in sub-period III D is flat and completely turned outwards. It well represents a last stage of evolution from the preceding periods. It then seems to be evident that, though marking a clear decay of the Indus Civilization, the Jhukar Culture cannot be dissociated from it. As for the identity of Amri III D with the Jhukar Culture as depicted from the type site and from Chanhу-Daro, no doubt is possible.

III

If one accepts these premises, we should now see which conclusions could be drawn as regards the Indus Civilization as a whole. Recent excavations have led a few authors to question such a chronology, or at least to confine its validity to a few sites in Sind. When more information is available it can be hoped these new sites will easily fit the Amri sequence and show a similar evolution from the pre-Indus well into that same Indus Civilization.

Let us start from the very beginning. At the time Amri was founded, it was a small settlement the limits of which corresponded to the actual surface of Mound A. After a while, in Amri IC, the village increased in size as it did in prosperity ; this can be deduced from the technical progress in pot-making.

During Amri IC and ID, Amri expanded in such a way as to include both mounds A and B, and it can be reasonably assumed that the intervening space was also included in the settlement and that it was later erased by a river flood which cut the then single mound into two separate units.

When the first sherds characteristic of the Indus Civilization appear, at the end of Amri ID, the village has indeed attained a maximum extent. As we have seen, these sherds seem to be imports and probably coming from Mohenjo-Daro which, being the largest city, must also, due to the depth of its unexplored deposits, be the oldest one too.

Immediately after the time of that first appearance of Indus pottery, Amri, with sub-period IIA, shrinks and traces of occupation are limited to Mound A. What led to that situation is still a guess. But Amri regains its former importance during sub-period IIB where Indus products are more and more numerous, before shrinking again and being located on one of the mounds only, this time Mound B. We then are at the beginning of Period

III A when Amri became, if I may say so, fully *Indusized*. But if we can consider the Indus material from I D to the end of II B as imports, we now know for sure, having found kilns in the excavations that the Indus pottery is, from that time on, locally produced.

As for the reason why Amri in III A reduced its size, we are able at least to propose a hypothesis. There was some fear in the air at the end of Period II as evidenced by the discovery of what must have been defences the remains of which have been found on Mound B. Having in mind the quasi identity of the material found in Amri III A and at Chanhudaro, one could suggest that fear was aroused by the foundation of Chanhudaro in the near vicinity of Amri. Being a town and not a small village it could have also exerted such an attraction as to suck in a large part of the Amri population. Amri then could have been down-graded from the status of a small market town to that of a village.

As seen above when reviewing the Amri material, this site could give a scale for a sequence at Mohenjo-Daro where pottery had been roughly distributed into two categories 'lower' and 'upper levels'. The pottery of Amri IIIA and IIIB (as well as that of Amri II) finds correlations in the lower levels of Mohenjo-Daro. Mohenjo-Daro thus, in its beginning and in its maturity, could cover a time going from Amri ID to Amri IIIA. Amri IIIB already could be termed as transitional, representing a phase between bloom and decay. Amri IIIB has characteristics of its own which are found at Mohenjo-Daro in the lower levels, and at places like Harappa and Kalibangan. Even Lothal shares some of its traits, but it is noticeable that the three last named sites, if sharing most peculiarities of Amri IIIB, have nothing from Amri IIIA. For instance, the patterns typical of Amri IIIA are not found in their free and cursive style of decoration. It is then logical to think that Mohenjo-Daro should be chronologically the first site of the mature Indus Civilization where a few products could have come from by trade to Amri at the end of ID and becoming more and more numerous during period II. Probably due to the influence of Chanhudaro founded at the end of Amri IIIB, Amri IIIA completely takes up the Indus fashion and even makes the same material.

In Period IIIB, the style of decoration shows a slight evolution as regards certain shapes as well as decoration. The wares made at that time exactly correspond to the material found at Harappa and Kalibangan and none of them has ever displayed shapes or decoration characteristic of Amri IIIA. For instance, no squat dish-on-stand has been found either by Vats or by Wheeler at Harappa. Only the high pedestalled one is present there.

Accordingly, the extension of the Indus Civilization to Punjab and to Sarasvati Valley probably is the result of a first migration coming from Sind and very likely from Mohenjo-Daro. This first migration is the result of geomorphological changes, as suggested by Raikes, or is due to other causes which will not be discussed here. It is nevertheless reasonable to assume that the end of that sub-period IIIB could very well be due to a first wave of invasions which spread on the whole Indus Civilization. That some unrest or the fear of external danger had arisen at Harappa was demonstrated by Wheeler who discovered there refections of the defences and the blocking of several entrances.

And if we come back to Sind, a similar process seems to be evident. We have already mentioned the importance of the changes in the products of Amri IIIC. Differences in the colour of the slip as well as a new technique in pot-making or new motifs in decoration seem to demonstrate foreign influences. At Mohenjo-Daro, if not a total and 'final'

massacre, many violent deaths at least occurred and all of them could well be attributed to disturbances which marked the change between the upper and lower levels. As a support for that change a few sherds noticed in what is given as 'upper level' (*E. Mackay, 1937, Pl. LVIII, 16, 18, 21, 24, 66*) belong to the kind with chocolate slip and patterns with heavy outlines which are at Amri typical of Amri IIIC. This comes as an evidence that, if life at Mohenjo-Daro went on for a time on its traditional basis, some of the new elements at least had been introduced.

For Chanhу-Daro the situation is quite different. From the excavations carried by Mackay it appears that the city was suddenly abandoned and remained deserted for a while. As for Amri, being smaller and poorer, it was occupied without any difficulty by a party of invaders who settled there and more or less mixed with the local population. Though being a city, Chanhу-Daro never was so large as Mohenjo-Daro or Harappa which could explain that it was built without any rampart. It then seems logical to think that when the first threat made itself clear, the inhabitants, fearing for their riches and for their lives fled from the city and looked for refuge outside. That such a party, looking for shelter, came to Amri seems almost certain. It would explain a few innovations at Amri during Period IIIC which could have been introduced by city-dwellers :

- A. It is at Amri the only level which yielded structures made of burnt bricks corresponding in size to the usual Indus standards. Before and later all buildings have been made of mud-bricks;
- B. However, Amri had adopted a few significant features of the material Indus Civilization, it had in the main remained untouched by its socio-cultural aspects, but during IIIC the Indus script had been introduced as evidenced by the discovery of two sherds with graffiti in that script;
- C. In connection with the preceding paragraph, it must also be mentioned that Amri IIIC is marked by the arrival of the well known 'Indus goblet' in the same way, one seal of Indus type and one fragment of Jhukar type were discovered in the debris layer from which came a mixture of various periods and mostly of Jhukar pottery. If the fragment can be ascribed to Amri IIID and to the Jhukar Culture, it seems more likely that the Indus seal should belong to Amri IIIC. Its design with a three headed animal has been encountered many times in the Indus Civilization and namely at Mohenjo-Daro (*J. Marshall, T. III, Pl. CXII, 382*).

All these facts are evidence of the introduction at Amri of socio-cultural aspects of the city life in the Indus Civilization, and it is highly probable that their bearers must have been the inhabitants of Chanhу-Daro then deserted.

It is likely that the Jhukar Culture was forced upon Sind by invaders coming from Baluchistan. This can be assumed from several facts. For instance, a large part of its pottery makes use of red as a second colour ; this is very often the case in Baluchi cultures and namely in the Kulli Culture. The Jhukar seals as known mostly from Chanhу-Daro and Jhukar have no relationship with the Indus seals, but they could be derived from a kind of seals a specimen of which was recovered at Nindowari in the same level as Kulli vessels and two seals of Indus type. That single seal, round and bearing just a simple geometric design could be ancestor to the Jhukar seals (*Casal, 1964, pl. XVI B*).

On the other hand, when reviewing the evolution of the dish-on-stand through Amri IIIA, B, and C, we did not mention IIID. No such vessels have been recovered at Amri

but Chanhu-Daro yielded many of them ; they usually are a little smaller than the high pedestalled dish-on-stand from Amri IIIB, and there is a tendency for the cup not to be so shallow as the Indus shapes. Their peculiarity consists in having a circular, ring-shaped, bulge in the middle of the shaft. Could such a ring-shaped swelling be considered as a model evolved from that frequent at Amri IIIC ? Such an evolution does not seem to be evident though it is possible. But the Jhukar model could at best compare with the dishes-on-stand from the Kulli Culture found at Nindowari. This origin could well fit in with the re-appearance in the Jhukar Culture of the bichrome decoration which had disappeared in Sind long ago, with the end of Amri II.

If such is the case, the Jhukar Culture could look like a blending of the Indus Valley Culture of Amri IIIC with that of Kulli. The Jhukar Culture being for the moment mostly ascertained in Sind could then be taken as a last local stage of devolution of the Indus Civilization transformed by its intimate relationship with a Kulli Culture already adulterated in its wanderings. The Jhukar Culture indeed in spite of its links with the Kulli Culture looks rather like a decadent stage of it. It could then be that part of the Baluchi people, themselves pushed forth by newcomers, led for a time a wandering life before arriving in the wealthy Indus plains, forming there a second wave of invaders who rather misbehaved in the conquered area. Being nomads and mountaineers, unaccustomed to city life, they did not try to settle in cities, but in smaller centers like Amri, more or less mixing with the local population which could have had more affinities with them. Besides, they re-occupied the ruins of Chanhu-Daro which had already been deserted for a long time. But as regards Mohenjo-Daro, their arrival was a mere disaster. They seemingly could be held responsible for the destruction of the city as evidenced by the final massacre which marks the end of an urban population before a last re-occupation of the ruins by a few squatters. If they did not settle at Mohenjo-Daro as they did at Amri, Chanhu-Daro or Jhukar, their passage there at least is marked by the discovery of a number of Jhukar sherds the presence of which was never referred to in the big volumes of the excavations at Mohenjo-Daro, but these sherds can still be seen in the reserves at Mohenjo-Daro and they are labelled as originating from various areas there (Fig. 4).

If we now try to summarize the various stages of evolution for Amri itself and for the Indus Civilization as a whole, let us remember that Amri shows a long duration which must have begun in the last quarter of the IVth millennium B.C. and could even be pushed back to the beginning of that same millennium if the MASCA factors have to be taken into consideration. Togau C and D should be included in the same limits.

As regards the beginning of the Indus Civilization, we must point out that in the

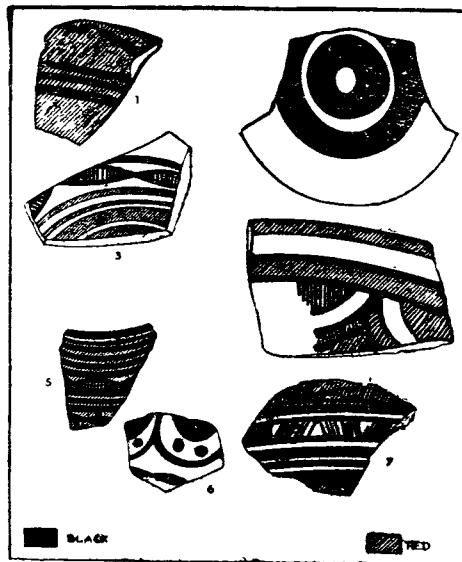


Fig. 4. Jhukar Sherds from Mohenjodaro.
1. D. 132 2. vs. 1928 3. HR D 78 4. HR 454
5. D 541 6. vs. 2920 7. D DK 10.528

same layers it is at first evidenced at Amri (Periods ID and IIA) two sherds have been discovered both partially representing animals the body of which is delineated in black but filled with red paint, thus reminding one of the 'scarlet ware' which was in use in Mesopotamia and at Susa and is generally dated to the beginning of the Early Dynastic Period. But other sherds with animals similar to those of Mundigak IV, 1 and Susa (thick outline and striped bodies) were found in the same Amri layers so that a date corresponding at the earliest to the Early Dynastic II could be assigned to them.

If such landmarks are taken as valid, the conclusion is that the beginning of the mature Indus Civilization should go back to the same date.

Let us here seize the opportunity of stressing one more point: The evolution at Amri shows how inadequate is the old terminology, unfortunately often in use, where Harappan Civilization and Indus Civilization are taken as equivalent. Harappa no doubt was the first site discovered of that civilization, but, as we have seen, it represents only a second phase of that civilization, which at Amri is that of Amri IIIB. As Kalibangan seems to be in many respects similar to Harappa and be the result of the same migratory movement, the same dating could be valid for both and it seems that their beginning could be fixed to ca. 2300 B.C. The so-called pre-Harappan levels at both places should then be roughly contemporaneous with Amri IIIA.

As regards emigration to the south and to Lothal, it must, at least partially, have been by a sea route. As at least one typical sherd of Jhukar pottery was found at the end of its first period, Lothal A, it can be thought, in order to maintain some concordance with the duration of Harappa, that its foundation occurred a bit later, let us say ca. one century later. We then are in the period of maximal extension of the Indus Civilization, with Mohenjo-Daro still living and newly created centres in full bloom in Punjab, Rajasthan and Saurashtra, and all that at a time roughly corresponding to the Akkadian Period where trade connections between the Indus and Mesopotamia seems to have been at their highest. But this glorious time was not to last for long. Very soon after 2000 B.C., the mature and unmixed 'Harappan' period was to come to an end with the advent of Period IIIC at Amri. At Kalibangan and Harappa the inhabitants deserted their cities; so did the Chanhudarans. At Mohenjo-Daro like at Amri the life still goes on with a first admixture of foreign elements. The time of Amri IIID finally represents the final stage of devolution and decay. Illiterate people just pass through Mohenjo-Daro and give it the finishing stroke. They swarm all over the country, re-occupying Chanhudaro and in many places mingling with the autochthonous population as to form the Jhukar Culture.

In Saurashtra alone the traditional way of life seems to go on. The Indus Valley fashions had taken there a local character. Being so far away from the large cities, towns like Lothal acted as conservatories for habits and for a civilization which had already disappeared in Sind and Punjab. The long prolongation of the Indus Valley there is attested by the discovery of the Jhukar sherd mentioned above. This could tend to show that the trade connections between the Near-East and India during the Isin-Larsa period could have had Lothal as their only terminal.

If excavations to come are to confirm the process here reconstructed from the birth to the death of the Indus Civilization, the significance of Amri will be remembered as having been the first site of that civilization where an evolution could have been traced.

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Harappan and Post-Harappan Settlement Patterns in the Rajkot District of Saurashtra

9

Y.M. CHITALWALA

A GROWING body of evidence relating to the Harappan civilization both in India and Pakistan has made it possible to reach conclusions of far-reaching consequences regarding its cosmopolitan character. It is now acknowledged that the 'Indus Empire' (the term used by Shri S.R. Rao), embraced a vast territory comprising distinct geographical units within the framework of a homogeneous culture. Such an understanding has also provided an insight into its central role in a widely radiating cobweb of economic activities. It appears that the urbanized outlook was collectively shared by cities, towns and villages alike. Nevertheless, an urban-rural dichotomy so far as the economic aspect of the civilization is concerned, is well marked. In some cases, however, ambiotic relationship cannot be ruled out altogether.

In Saurashtra, as in Sind, similar incentives were operative constituting the socio-economic strands that went into the fabric of an urban order of basically uniform nature. The regional variations corresponding to the distinct ecological setting were at work but the cultural forces emerged rather too strong to impair the fundamental homogeneity, till at a later date when the processes of decay and reformulation set in.

Environmental Setting

Geologically, a greater part of Saurashtra is an extension of the Deccan Trap, a post-Cretaceous formation, which also covers Peninsular India in the form of horizontally bedded sheets of lava of varying thickness (*Wadia, 1970 pp. 292-304; Dikshit, 1970, p. 9*). The district of Rajkot occupying a total area of 4,588 sq. miles, incorporates the Trappian formations, prominently in the eastern part in the form of a hilly region. Its branches radiate north and east and determine the drainage of the area as a part of the centrally located radial drainage pattern of Saurashtra from which emerge most of the major rivers. In the western part of the district the Trap has worn out to form a level plain of black soil and in turn is superseded by the alluvium of the river Bhadar to the south-west (*Gazetteer, 1965, pp. 1-2*). The river rises in the neighbourhood of the town of Jasdan in the east and has a course of 80 miles through the southern part of the district. Its volume swells between the towns of Jetpur and Kutiana with a substantial

increase in the speed of the flow (*Lele, 1972, p. 15*). The tracts of land flanking the river, comprise much of the fertile agricultural area, accounting for the highest population densities in the district (*Census, 1961, p. 258*). Two other rivers—the Aji and the Macchu, smaller than the Bhadar have their flows reduced to a trickle when summer heat turns the countryside into a blast furnace shooting the temperature as high as 40.6°C. (*Gazetteer, 1965 pp. 9-10*). Both these rivers take a northerly course through an undulating plain of medium-black soil till they disappear in the sands and swirls of the Gulf of Kutch.

The contemporary setting on the map reveals that the environment reigns supreme and human endeavours assume rather a secondary role. The rivers fork out in different directions with towns and villages precariously hugging their banks. The reasons for such npattern are not far to seek. The environmental pressures determine the optimum locations ensuring a perennial supply of water on the basis of priority and next to it arable land. The overwhelming dependence on water is dictated by erratic and unpredictable rainfall averaging about 24 (589.7 mm) inches a year (*Gazetteer, 1965, pp. 64-65*). It is, therefore, the water and not the land that prescribes the man-land relationship to a large degree. The occurrence of modern and ancient sites by water courses shows that the passage of time has not altered this relationship in any appreciable way. The concentration of narrowly spaced settlements around a town or a big village with a built-up area consisting of fertile soil and easily accessible source of water paraphrases an agriculturally oriented economy both in modern and ancient contexts. This is borne out by the fact that agriculture today constitutes the main source of livelihood for 4,48,790 persons out of the total rural population of 6,36,453 distributed in 855 villages and in terms of proportion 3.5 of the total population of the district with 68 per cent of the total area under cultivation (*Gazetteer, 1965, pp. 161-65*). Of the important cereals, wheat accounts for 25 per cent of total acreage and 53 per cent of total irrigated area in a climate where 94 per cent of the crops depend on an uncertain monsoon. Millet, bajra and pulses come next in an order of importance all of them being kharif or spring crops. Wheat is a rabi or winter crop, whereas cotton season lasts from July to November. Both these sustain well on medium black soil with a high water holding capacity. Fair-servis has noted that the Harappans essentially flourished in the wheat and cotton growing regions of Sind, the Punjab and Gujarat (*Fairservis, 1971, p. 311*).

The vegetative cover of the district is tenuous and xerophytic. *Acacia*, *Caparis*, *Zizyphus*, tamarind, and banyan are normally encountered. Pippal, margosa, and mango trees are few and far between. Probably a serious depletion of forests had taken place in the past as a result of clearance for agriculture and overgrazing. This had a direct effect on the fauna. Only jackals, foxes, hyenas and hare survive, while panther (*Felis pardus*), gazelle and spotted deer, have all but disappeared (*Gazetteer, 1965, pp. 13-14*). Along the banks of the rivers and streams seasonal aquatic grasses grow during rains and provide excellent forage to the cattle.

Measurements and Environs of Explored Sites

- × Location on rocky prominence
- = Location along a perennial watercourse
- Location on non-perennial watercourse

- + Availability of arable land
- ★ Good vegetational cover
- H = Harappan
- P = Post-Harappan
- HP = Harappan and Post-Harappan

Sr. No.	Name of the site	Approximate size in Mtrs.	Approximate shape	Period	Environ- ment
1	Belora	60×100	○	H	=+★
2	Bnatiwadi	120×75	○	HP	=+
3	Dad	220×120	○	H	×-+
4	Devalkano-Dhoro	10×10 (disturbed)	x	P	-+
5	Devalkano-Timbo	90×16	○	HP	×-+
6	Dhurasiano-Timbo	225×90	○	HP	=+★
7	Hemadra	50×50	○	P	=+★
8	Jagtapiro-No-Dhoro	120×60	○	P	-+
9	Kanadia	126×42	○	P	×-
10	Kerala	80×100	○	P	=+★
11	Khanpar	330×150	○	H	=+
12	Lukhela	90×50	○	HP	=+
13	Meghapar	50×30 (disturbed)	○	P	×-
14	Moti-Parbadi	200×100	○	P	=+
15	Pal	200×100	○	H	×=
16	Randalna-Dadva	100×100	○	HP	-+★
17	Rojdi	500×130	○	HP	×=+★
18	Shisak	130×80	○	P	=+★
19	Shimoyno-Dhoro	90×80 (disturbed)	○	P	=+
20	Thebachada I	250×200	○	P	×=+
21	Thebachada II	100×100	○	P	×-+
22	Timran	300×150	○	P	=+★
23	Traghada	500×400	○	H	×=+★
24	Vadli	250×50 (disturbed)	○	HP	=+★
25	Vegadi	300×200	○	HP	×=+

Discussion

From the list of sites it would appear that in Saurashtra as in Sind, a hierarchy of sites ranging from tiny hamlets to villages and towns, are met with. Most of these nestle

close to the banks of rivers and streams occupying vantage points that gave access to a dependable supply of water, soil and a commanding view of the countryside.

The location of settlements on higher grounds viz. a rocky outcrop or a hillock is interesting and instructive at once. Besides facilitating hunting, as movements of game could easily be marked from long distances, they ensured safety against the recurring floods which are supposed to have destroyed many of the Harappan sites in Sind as well as in Saurashtra. Thus the rocky prominences in a way substituted the large platforms of Mohenjo-Daro, Harappa and Lothal. The tradition of seeking safety from floods and possibly invasions was so implicit that some sites were chosen on the merit of their being at a higher level than the surrounding plain in spite of their barrenness and agriculturally non-productive milieu. This hypothesis is supported by the fact that excavations at Rojdi brought to light mud-brick platforms, on which were erected houses and other structures. The backslopes of some of the protuberances permitted a better surface drainage and an enlarged catchment area created run-offs ensuring good supply of water that could be used for the purposes of irrigation.

As far as can be ascertained from surface indications, and already commented upon, soil and water were the two basic determinants of the settlement pattern obtaining in the area. The medium black soil of the Rajkot district is fertile enough to reward the labours of any agriculturist who is prepared to brave the ever looming danger of failure of monsoons which often is the case. However, as a retribution, the soil has a high water retaining capacity and as a result it does not disintegrate into desert despite the burning heat of severest summers. Cotton and wheat, two important crops of Harappan times, are favourite of the farmers even today. Besides, Harappan and Post-Harappan peoples in Saurashtra, raised rice and bajara (*Pennisetum typhoides* Stapf, and Hubb) (Rao, 1962-63, pp. 168-69). Wheat, as postulated by Fairervis and Lambrick was winter or rabi crop during the Harappan times, entailing some sort of irrigation (Lambrick, 1964, p. 76; Fairervis, 1967, p. 29). In Saurashtra the evidence relating to the cultivation of wheat is lacking. This, however, may be due to the fortuitous and inadequate nature of investigation rather than the total absence of evidence. Wheat being a staple crop in the Indus Valley, cannot by any stretch of imagination, be presumed to have been abandoned by the Harappan farmers in Saurashtra. On the deep and medium black soils of the Rajkot district, it is grown as a dry crop and perhaps during the Harappan times also the situation was same as today. Many of the sites situated on the river banks appear to have secondary streams running in their immediate vicinity as in the case of Rojdi. Apart from warding off danger from humans and animals, they probably played an important part in the economic life of inhabitants. However, it is not possible to commit on this count in the absence of a direct and conclusive evidence. Soil and water—two important items of a subsistence economy played supplementary role in relation to each other where optimum location was possible. In cases where a choice had to be made as regards either of the two, any of them assumed secondary role corresponding to environmental backdrop which demanded maximum of adaptability leading to secondary modifications in the lifeways of the people. Thus, some sites situated at a distance from the permanent source of water must have led to a daily and laborious trek to and fro the river or stream, keeping a sizable segment of population busy with the carrying and storing of water for various domestic uses. On the other extreme, some settlements reflected overwhelming preference for water at the expense of fertile but distantly situated soil. In such cases as

Smith has pointed out in the neolithic context, economy was possibly multi-based incorporating systematic domestication and an active pre-occupation with hunting and fishing (Smith, 1972, p. 402).

From the number of bones of cattle, forming a part of surface collection, it may be suggested that cattle farming was an important integral component of Harappan and post-Harappan economy. Apart from this, the ritualistic significance attached to the bovines, determined the ambiotic relationship between man and cattle, though the taboos prevalent at present in this context, were not so much the part of the religious order of that period. That the cattle were expendable for the sake of food is amply borne out by the fact that at Rangpur and other sites bones were found to bear chopping marks and the majority belonged to *Bos indicus* or the humped cattle of which the powerful bulls figure so prominently on the Indus seals (Rao, 1962-63, pp. 253-55; Allchin 1963, pp. 45 and 162, also 1968 ; Joshi and Allchin, 1972, p. 38).

The advantages accrued from cattle farming can hardly be overstated in a subsistence economy which as a rule entails maximum exploitation of available resources. Besides being source of food like meat and milk, the cattle serve as chief source of energy for ploughing and drawing carts and as beasts of burden. Cattle dung is valuable in so far as its utility as manure and fuel is concerned. While consuming stubble in fields after the harvest, the cattle help in restoring the fertility of the soil by providing manure in the form of their droppings.

Apart from cattle, buffaloes were also domesticated in Harappan Saurashtra as in Sind. The bones of *Bos bubalis* were recovered from Rangpur and the animal was probably an important component of Harappan economy (Rao, 1962-63, pp. 253-55).

In India the ratio between the total cattle population and available supply of fodder tends to be adversely balanced on the side of cattle. Probably this was the case during Harappan times too, since cattle were held in some sort of cultic reverence. Fairervis has calculated that only one-fourth of the total needs of cattle could be met by growing fodder and the rest of three-fourth 'had to be obtained by foraging in the surrounding forests and grasslands. This formidable assault on the indigenous flora most certainly affected ecology' (Fairervis, 1967, p. 39). In the case of Saurashtra, as has already been pointed out, flora probably suffered due to overgrazing and the resultant deforestation led to the withdrawal of some of the species of fauna to remote and congenial niches.

Besides cattle, other animals included goat, sheep, pig—both domesticated and wild, dog and gazelle. These have been reported from the late Harappan site of Khanpar (Chitalwala and Thomas, 1975). The find of *Sus scrofa* or wild pig would suggest a habitat incorporating marshy conditions. At present, however, the landscape looks desolate having a very thin cover of xerophytic vegetation mostly consisting of various thorny bushes. The area is decimated from the point of view of crops and water on account of the recurring famines of last four years. This only serves to illustrate the extent of damage done to the landscape by human interference.

The Harappan and post-Harappan sites in the Rajkot district are either rectangular or oval and circular or semi-circular, indicating two types of village planning with distinct socio-economic implications. Linear enclaves of these settlements spread out in the river valleys and have sometimes closely spaced units, implying an intensive cultivation leading perhaps to some surplus which conferred an economic incentive that underlines the town-village relationship. Some degree of centralised control can be postulated as

pointed out by Adams in the case of the Diyala plains where towns are surrounded by small and secondary settlements (*Adams, 1965, p. 41*).

This is, however, more true of the Harappan rather than the post-Harappan settlements. The difference between the settlement patterns of these two periods is of degree than of kind. Most of the post-Harappan settlements are located where the Harappans had already settled. Such sites display their considerable proportions in so far as their size and thickness of occupational debris are concerned. In the case of an independent choice of site locus, the thin deposits as well as small size of the settlement indicate that the inhabitants had not quite succeeded in harnessing the environment to its fullest capacity. This would also explain the sporadic nature of the site distribution, especially in the northern half of the Rajkot district. The tendency of 'budding off' of the smaller segments from the parental settlement had not taken place as the carrying capacity of the environment had remained more or less stable. The result is that the site scatter is not very crowded and the distance between one site and the other would therefore mitigate any chance of an appreciable degree of inter-connection. In the absence of high population density in any particular area, the scatter is maximum. It can, therefore, be postulated that the social fabric of the post-Harappan people was rather weak and the political order not of hegemonic nature as the economic conditions were geared more to meet the bare subsistence requirements than to gain any surplus. Moreover, the distance involved in the extensive nature of site scatter would preclude any effective political control. The result was that the post-Harappan phase with its built-in mechanisms prevented any possibility of economic development even roughly comparable to the one achieved by the Harappans.

If surface contour of a mound is any indication, then a rectangular or oval mound should suggest a linear planning and circular or semi-circular site, a nucleated settlement. This however, is not always the case, as is evident from what we know of the site of Rojdi and excavations conducted there. The mound of Rojdi is divided into three zones called Mounds 1, 2 and 3. The site spreads out axially along the bank of the river Bhadar so as to take the advantage of the maximum river front. Mound 3 to the south has its periphery girdled by a nala which flows into the Bhadar.

Since the excavations were not carried out with a view to delineate the settlement pattern, the data available is too tenuous to indicate anything beyond the barest outline. While more or less rectangular spread of the mound would suggest a linear settlement, a reconstruction of Harappan village done at the instance of the excavators, shows a nucleated planning. Assuming that the said reconstruction was based on factual data, a brief discussion of skeletal nature has been attempted below.

The nucleated settlement evidenced by the concentration of structures on Mounds 1 and 2 and multi-roomed residential units (as the plans examined showed) indicate a minimum dispersal of the household. As a consequence, the social structure would be dependent on the inter-relationship of closely knit groups, formed along kinship lines, leading to organized economic forces, developed under social norms that are regulated and enforced by an institutionalised authority. Theoretically, it may be suggested that the division of labour in such a situation may go beyond sexual differentiations and acquire social significance, representing the stratification of society having economic undertones. Whether such a stratification was present among the Harappan inhabitants of Rojdi, cannot be spelled out specifically for the present, yet it

would not be asking too much to expect just such dispensation, as the people appear far too advanced to live on hand-to-mouth basis. The mud-brick platforms on which they constructed their structures, beads of various shape and material including gold, use of Indus script, well laid out structures embodying an element of planning and the variety of pottery vessels used, all combine together to paint a picture of life which had had for long broken free of an existence at a level of naked subsistence.

This apart, nucleated settlements suggest occupation of a long duration and are indicative of ambiotic relationship with a centrally located ceremonial or administrative centre commanding a general allegiance of the townsmen or villages. In such cases artifactual attributes reflect a general uniformity (*Deetz, 1968, pp. 41-48*) and group attitude towards ecological factors lead to corporate endeavours like the building of circumvallation wall, tanks, temples and so on. In this context it hardly needs recapitulating that both Harappa and Mohenjo-Daro in Sind and Lothal and Rangpur in Saurashtra were elaborated nucleated settlements demonstrating a mass psychology as far as general adaptability to a given environment was concerned. The Harappans of mature phase had reached a level of development when urbanism apart from having a physical connotation, had become an attitude of mind.

Conclusions

The Harappan homogeneity in the Rajkot district, it would appear, underwent certain modifications in response to environmental variations, which ranged from desert-like wilderness in the north to the fertile greenery of the Bhadar valley in the south (*Wheeler, 1968, p. 3*). This ambivalence neither allowed the Harappans to flourish as freely as they had done in the Indus Valley nor displaced them completely so as to confuse their identity. As a result, the urban concept of life could not find physical expression and most of the sites except Rojdi economically remained at the third stage of Fairservis's five-step developmental ladder (*Fairservis, 1967, p. 9*). Ostensibly, the urban tendency was, therefore, set on reverse gear and the coherent form of a life based on economic compulsions over a wide area was in a process of taking roots. The ambivalence is further reflected when we take the case of Saurashtra at large. The fact that Lothal as a port-town traded with as distant a place as the Persian Gulf sufficiently argues for the degree of economic sophistication achieved (*Dales 1962*). In contrast, however, rest of countryside continued to be dotted with small settlements, some being on stark subsistence level, struggling to come to terms with an environment which combined effects of both the desert and oasis (*Subbarao, 1956, p. 59*). It is, therefore, not surprising if this duality is found in the overall settlement pattern—the linear and nucleated settlements—big and small, some resting on bed-rock, others on the margin of fertile soil and permanent supply of water.

Acknowledgements

The paper is based on the results of a very short season of a preliminary field-work. In view of the meagre data available, it does not purport to be an exhaustive study nor such conclusions as drawn from inadequate evidences are to be treated as irrevocable, pending an investigation of more intensive nature. As far as the discussion on Rojdi is

concerned, the author acknowledges his debt to Mr. J.M. Nanavati and his staff of the Gujarat Directorate of Archaeology for granting access to as yet unpublished excavation material. Thanks are due also to Prof. H.D. Sankalia who encouraged me to write this paper.

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The Late Harappan Cultures in India

10

K.N. DIKSHIT

THE TERM Late Harappan Culture has been variously described but in the absence of an acceptable definition the matter is still a debatable issue. Literally the term could mean the end or climax of Harappan Culture. Precisely the Late Harappan Culture could be identified with the archaeological assemblages which follow the cultural continuity of mature Harappan and its associated miscellany.

The general homogeneity of Harappa Culture which existed throughout its mature phase was broken as is evident from the assemblage of Late Harappan Cultures. It may also be mentioned that different pottery types and other cultural traits emerged in every region but unconnected with each other. In fact these cultures on the other hand appear to be the outcome of the normal process of cultural transformation in Harappa Culture and the internal interaction of the society due to economic decline. However, a few of the cultural traits of mature Harappans as revealed from the excavations of Mohenjo-Daro, Chanhu-Daro, Harappa, Lothal and Kalibangan such as systematic lay out of the cities, use of standard sized burnt-bricks for houses, drains and baths, script on seals or pottery, distinctive painted motifs and ceramic forms, triangular terracotta cakes and animal figurines, chert blades, faience, copper or bronze objects and disc-beads, are must for labelling any assemblage as Harappan Culture. The Late Harappan Cultures witnessed a general decline in the civic standards of this culture. Planned big houses were replaced by inferior structures. Especially Mohenjo-Daro witnessed in later times the encroachment of public places and city streets by its inhabitants in an unprecedented manner .

Regional Survey

The following is the distribution of Late Harappan Cultures in different regions of India:

NORTHERN RAJASTHAN

The Harappan sites reported from the valleys of Saraswati and Drishadvati has no late Harappan assemblage. In fact all the material remains on these sites remind the mature stage of culture which bespeak an absolute homogeneity of Harappa Culture (*Ghosh, 1965, 1953*). Kalibangan yielded even a pre-Harappan phase. The earlier explored sites from Sherpura near Bhadra upto Pakistan border were revisited by the author in 1978 for the selection of a site for excavation but no Late Harappan material was found on them. It may also be noted that beyond Suratgarh to Anupgarh, pre-Harappan material is quite limited in exploration. The excavation of Baror may provide new material for assessing the culture-interaction of this region.

GUJARAT AND SAURASHTRA

The survival of Late Harappan Cultures from mature to late is very clear at Lothal, Rangpur, Sankotda, Desalpur, Prabhas Patan and Somnath and again further south at Megham and Talod in the Narbada and at Bhagatrav and Malwan in the Tapti estuary. Lothal A—a port town—revealed typical mature Harappan assemblage, whereas in Lothal B a gradual transformation was noticed which could be equated with Rangpur IIB (*Rao, 1963*). The convex sided bowls show change whereas beaker, goblet, small jar and basin gradually disappeared and were replaced by the newly evolved ones. No mud-brick houses, drains and baths were noticed. Other structures were poor. The Harappan Cultural traits further deteriorated in Rangpur IIC. This phase is marked by fine Lustrous Red Ware and white painted black-and-red ware. Terracotta cake or perforated jars were absent. The Period III is marked by the profusion of Lustrous Red Ware and White painted black-and-red ware. The use of faience and steatite vanished.

At Sankotda, it was towards the end of Phase B and in Phase C that a white painted black-and-red ware akin to Ahar was found dominating in Harappan complex, whereas at Lothal this ware was present right from the beginning. The types consist of bowl-and-dish, handled bowl and channel handled bowl. However, goblets and perforated jar in Harappan red ware were also available but in a restricted way. There was no Lustrous Red Ware. Other objects include terracotta bull, cart frames, wheel, chert blades, copper and faience objects. The rubble masonry fortification was also reconstructed in this phase (*Joshi, 1973*).

Desalpur also revealed a cultural continuity from mature to late Harappan phases. In late phase the cream slipped biochrome ware was present in the form of dish and bowl. The white painted black-and-red ware also made its appearance. No lustrous red ware was found. The handled saucepan in red ware with a deliberate curved top for a firm grip which started from the mid-levels of mature phase are in profusion in late phase. Other objects include knives, chisels, rods and rings of copper and ribbon flakes of chert (*Soundara Rajan, 1977*).

The excavations at Rojdi, Prabhas Patan, Somnath, Amra and Lakhabhawal also indicated a gradual transformation of the Harappa Culture. At Prabhas Patan, late Harappa pottery, microlithic blade industry and segmented faience beads were noticed in the earliest level. In period IIA Lustrous Red Ware alongwith sophisticated motifs including antelope on a sturdy red ware made its appearance, whereas in Period II B Lustrous Red

Ware declined and a plain slipped ware emerged (*Rao, 1973; Agarwal, 1971*).

MAHARASHTRA

The Late Harappans also reached in the Tapti valley of northern Maharashtra from coastal region of Gujarat and co-existed with a sub-Indus culture as is evident from Period IA—at Prakash (*Thapar, 1967; Dhavalikar, 1977*). The reported Harappan phase (Period II) at Daimabad requires a closer analysis (*Sali, 1977*). The occurrence of three Harappan like characters, inscribed on the inner side of the rim of a pot, is an interesting find from this place. Such graffiti marks, however, were also encountered on the pots in Period IIC and III of Rangpur. ‘U’ or ‘V’ shaped graffiti marks were also noticed on potsherds at Prabhas Patan, Bahal, Prakash, Piklihal and Navdatoli (*Rao, 1963*).

HARYANA

In Haryana specially in Drishadwati and Saraswati valleys the settlements of Late Harappan Cultures are comparatively much more in comparison to mature Harappan. It was also observed that these later settlements are generally away from the perennial rivers and are located outside the flood plains of seasonal streams. The excavations at Mitathal and Siswal revealed a cultural sequence starting from pre-Harappan to Late Harappan times (*Suraj Bhan, 1977*). Mitathal IIA is characterised by mature Harappan Culture and continuation of certain pre-Harappan types, whereas Mitathal IIB is marked by a gradual decline in the material culture. The types dish-on-stand, storage-jar, vase, bowl-like-lid and basin were considerably modified in forms. The ceramic of pre-Harappan traditions like Siswal also survived in this phase. The use of goblet, beaker, perforated jar etc. were rare. The pottery indicated a general decadence in fabric, potting and treatment of surface. A variety of incised designs were also noticed on the exterior of vases. This phase IIB conformed well to Daulatpur, Mirzapur and Bhagwanpura IA (*Joshi, 1977*). At Bhagwanpura IA besides Harappan pottery, a terracotta humped bull, a portion of human figure, copper rods and pins, beads and bangles of faience were also noticed. In IB the inter-locking of Late Harappan Culture with Painted Grey Ware (PGW) was seen. Besides pottery, other antiquities of terracotta, glass, ivory, bone and copper were also recovered. The terracotta anthropomorphic figures from this phase have parallels in the Gandhara Grave Culture (*Joshi, 1977*). No iron object was found. The overlap phase also revealed three structural phases starting from round or semi-circular huts, houses of mud walls and ultimately houses of baked bricks. As ploughing damaged all the structures, it is difficult to associate them singularly with the activities of Harappans or PGW.

At Daulatpur, about 8 kms from Bhagwanpura, no such overlap was noticed (*Singh, 1977*).

PUNJAB

One can see three phases of Harappa Culture in Sutlej basin of Punjab starting from Kotla Nihang Khan to Ropar, Bara, Dhar Majra, Chandigarh and ultimately to Sanghol, Katpalon, Nagar and Dadheri. The Harappan complex of Drishadwati valley in Haryana

is different from this (*Sharma, 1976*). The earliest phase at Kotla Nihang Khan revealed limited use of mud and burnt-bricks alongwith the characteristic Harappan pottery and other objects like bronze celts, chert blades, faience, ornaments and terracotta cakes and beads. At Ropar, a steatite seal was also found. Alongwith the mature Harappan types modifications in existing types like dish-on-stand with dropping rim, jar with horizontally splayed out rim, bowl-like-lid etc. were also noticed.

In Late Harappan context, the position of Bara may be taken as a distinct culture as its antecedents are traceable to a pre-Harappan tradition (*Sharma, 1976, 1977*). The pattern in which Harappans and Barans moved and settled in Punjab is not clear. The middle and upper levels of Bara came in contact with mature and late Harappan phase.

From Dhar Majra (*Olaf Prusser, 1951*), Chandigarh (*Ghosh, 1971*) and Sanghol (*Bisht, 1976*), it appears that in the Late Harappan culture different types of wares such as pre-Harappan, Harappan and also some non-Harappan wares mingled and continued. Dadheri, a Late Harappan site, confirmed the sequence of Bhagwanpura excavations. Other objects include copper objects, terracotta beads, wheels and round cakes, faience bangles and a terracotta painted bull. At Katpalon and Nagar, Late Harappan pottery complex and PGW were found together from the beginning (*Joshi, 1977; Dikshit, 1967*).

JAMMU AND KASHMIR

The above sequence was also noticed at Manda, Akhnoor on the Chenab in Jammu and Kashmir. The mature phase which yielded typical Harappan pottery, triangular terracotta cakes and a double spiral headed copper pin was succeeded, according to the excavator, by the continuing use of Harappan pottery alongwith the appearance of the Grey Ware of PGW assemblage. A thicker variety of burnished Grey Ware is also available (*Joshi 1977*). In Period II at Burzahom, a kind of late Harappan intrusion was also noticed in a plain burnished grey ware complex of neolithic times. A few of the Burzahom grey ware types have typological parallels in Swat valley (*Khazanchi and Dikshit, 1978*).

UTTAR PRADESH

The Harappan sites in Uttar Pradesh are confined to its western area with a heavy concentration in Saharanpur District (*Deshpande, 1965, 1977*). These sites are generally located on the tributaries of river Yamuna and are more influenced by the Harappan complex of Sutlej valley. The average occupational thickness of Harappan settlement in this region is somewhere from 0.75 to 1.50 m. They are not more than 200 metres in length and breadth which suggest that the habitations belong to a small cluster of families. The Late Harappan Culture lost much of its mature traits in this region. In Saharanpur District these sites are located at a distance of 8 to 12 kms. This settlement pattern conforms well with Haryana, Punjab and even Gujarat and Saurashtra (*Dikshit, 1970*).

The Harappan phase at Alamgirpur, Meerut District yielded typical plain and painted pottery, terracotta objects comprising animal figurines, cakes, cart, cubical disc beads and bangles and copper or bronze objects (*IAR 1958-59*). Beads of steatite and semi-precious stones and bangles of faience were also noticed. Burnt bricks conforming to two

sizes ($11\frac{1}{4} \times 5\frac{1}{4} \times 2\frac{1}{2}$ and $14 \times 8 \times 4$ inches) and inscribed Harappan symbols on a trough were also noticed. At Bargaon, Harappan pottery recovered in excavations is plain, painted and incised. An admixture of Ochre Coloured Ware (OCW) was also noticed. Terracotta cakes from this region are generally oval in shape, although a few of them are longer ones with tapering ends but implying their manufacture by hand due to the presence of prominent finger impressions. Other antiquities are copper rings, chert blades, faience bangles and terracotta objects.

The pottery of Late Harappan period revealed a typological affinity with OCW which is also circumstantially associated with Copper-Hoards in this region. One can notice pure Harappan sites and also sites mixed up with OCW in the Yamuna valley of Saharanpur District (*Dikshit, 1977*). As no Harappan settlement is noticed beyond Hindon, a tributary of Yamuna, the OCW settlements in central Ganga-Yamuna Doab are free from any admixture although at Ambkheri, an OCW site in upper doab definitely shows a culture contact with Late Harappans in the form of terracotta objects like, beads, oval cakes, hubbed cart-wheel, animal figurines and a solitary carnelian bead. From Central Doab where OCW is also reported in excavations at Baharia, Saipai and Atranjikheda, no such Harappan contact is discernible (*Dikshit, 1973*). At Saipai, Itawa District, OCW and Copper-hoards were reported together in regular excavations (*Lal, 1971-72*).

The OCW has also been reported from Eastern Rajasthan. The absence of OCW in the Katali and Dodhan river valleys lying in the Khetri belt of Sikar and Jhunjhunu Districts confirmed that OCW is an extension of Central Doab complex through Sota and Sahibi, the tributaries of Yamuna. This conclusion is based on a recent survey undertaken in 1978 by the author with the assistance of his colleagues. The pottery picked up from Singhana, Dariba, Udaipur and at a number of other places from Katali and Dodhan recall the ceramic tradition of the Rangmahal culture of north Rajasthan roughly contemporaneous with the Kushan and early Gupta periods.

Chronology

The Harappa Culture did not totally die out as is clear from the above survey, but survived in later times in Gujarat, Punjab, Haryana and parts of western Uttar Pradesh somewhere between c. 1700 and 1000 B.C. This time bracket is suggested on the basis of their continuity with the end of mature Harappa (c. 2300-1750 B.C.) on the one hand (Rangpur, Desalpur, Ropar etc.) and their overlap in the final stage with later or other contemporary cultures on the other hand (Bargaon, Dadheri, Katpalon etc.).

The radiocarbon dates from Bara 1890 ± 95 and 1645 ± 90 could also be considered in this context. Bara revealed 14 layers and the earliest date is from the middle level-layer 9 at a depth of 1.20 m. before surface, thereby suggesting that the occupation at this site must have continued for 400-500 years more.

The typological similarity of late Harappans with OCW in Upper Doab and the occurrence of both the wares from the same level at Bargaon shows that end of late Harappans was a very slow process.

There is no problem in dating the beginning of late Harappans but to prove the suggested end to c. 1000 B.C. would require more work.

The overlap of late Harappans with PGW users has to be confirmed at a few other sites so that a normal process of borrowing of the cultural traits, if any, could be known.

The late Harappans and PGW co-existed at least for a century or so at Bhagwanpura, Dadheri, Nagar and Katpalon but without influencing the cultural life of each other. The co-existence of these people in a strict compartmentalised manner has created more problem rather than solving the issue. The evolutionary sequence of structural phases starting from huts to burnt-brick houses at Bhagwanpura and also at Dadheri may be correct for PGW people, but it cannot be applied to late Harappans, as Harappans maintained the standard ratio of 1 : 2 : 4 while manufacturing the bricks even in later times at Mitathal IIB.

The overlap of late Harappans with a Grey Ware of thicker and thinner variety at Manda also requires clarification. In east Punjab, the dishes and bowls of Grey Ware have generally been reported from the levels of Northern Black Polished Ware (c. 400–50 B.C.) and not from the Painted Grey Ware horizon. Except a few sherds, the Manda Grey Ware is different from the reported Grey Ware of historical period and also from sturdy Harappan grey ware. It is a thick sided ware with paste not very purified and baking not always uniform. The surface is generally polished and ash-grey. There are also a few sherds of thin ware with fine paste and mostly well-baked. A thick variety of burnished grey ware is also present. However, a wheel-turn burnished grey pottery has been found across the frontier in Gandhara region (*Silvi Antonini and Stacul, 1972, Dcni, 1967*).

The excavations revealed the graves of three cultural periods at Timargarha and confirmed the same at a habitational site at Balambat. Period I and II belong to Chalcolithic period (c. 1600–1000 B.C.) and III to Iron Age (c. 900–600 B.C.). The pottery reported from here is grey as well as red in both the periods with certain transition in forms. In Period III, the Grey Ware continues with some new forms. The horse is also associated with this culture. A few shapes associated with the PGW could also be compared with the pottery of the Gandhara region (*Lal, 1977*).

A similar culture-complex of Gandhara Grave type having spindle-whorls, bone needles and harpoons, mace-heads, arrow and spear heads, beads and a number of copper-pins with different types of disc-heads, was also noticed in the graves at Katalai, Loebanr and Butkara II. In this complex besides other cultural traits, an echo of late Harappan forms could also be seen such as cup-on-stand, conical or cylindrical beakers with flat or disc base and slightly bell-shaped pots. At Loebanr III, a few sherds of red ware with black paintings turned on fast wheel possibly an importation from other contemporary culture was also noticed between 1700–1500 B.C. (*Stacul, 1977*). Stacul has suggested a slightly different time-scheme. However, his sequence is not a series of progressive changes but starts with new people reflecting major ethnic changes in northern Iran and south central Asia.

The excavations at Zarif Karuna in the Peshwar plain also revealed a cemetery site associated with Gandhara Grave culture and those of Swat and Dir. In addition to pottery, terracotta female and bull figurines and personal ornaments of bone, silver, gold and stone were also encountered (*Mughal, 1972*).

The Period II at Burzahom (*IAR 1961–62*) also revealed a few painted red ware sherds and copper arrow-heads with mid-ribs possibly of late Harappan origin, in a dominating plain grey ware complex identified as late neolithic. A few of the grey ware pots, specially deep bowls or cups with outlying sides or pedestalled or hemispherical bowls with a ring base, globular vase with flared rim or vertical rim and disc base and crouched position of skeletons connect this phase with the similar material in Swat valley.

(*Khazanchi and Dikshit, 1978*).

At Manda, the plain Grey Ware pottery of Period I and II of Gandhara Grave culture might have made its intrusion, as chronologically this pottery and late Harappans are of the same time-span. The dishes are scarce in this complex and pots are generally flat or disc-based. The deep incurved bowls, flask and shallow-lids of Gandhara grave culture may have a typological affinity with Manda.

Discussion

Possehl (1977) has designated even post-Harappan Jhukar and Cemetery—Cultures as Late Harappans, although these cultures mark a distinct change from the preceding mature Harappan Culture, and also lack cultural continuum. There is also no gradual replacement of mature Harappan traits by these cultures and as such they should not be called as Late Harappans.

Instead of calling certain sites as Late Harappans in Punjab, Sharma wants to label them as Late Barans as he doubts the proposition that Bara represents a late Harappa Culture, its ceramic industry being derived from Kalibangan I and Harappa Culture (*Sharma, 1976*). However, this position is not acceptable for the time being, as except pottery, other cultural traits of Bara are still undefined whereas a few Harappan traits such as terracotta cakes, cart-frames and wheel, faience objects and standard sized burnt-bricks in 1 : 2 : 4 ratio are still available in Late Harappan complex.

In Jammu and Kashmir, the co-existence of Harappans with the people using Grey Ware or Painted Grey Ware variety is doubtful. No Painted Grey Ware has been reported from any part of Jammu and Kashmir so far. The village to village survey of antiquarian remains in the border districts of Amritsar and Gurdaspur has not revealed any site with good Painted Grey Ware specimens, whereas in the adjoining districts of Jullundur and Ludhiana, it is freely available from a large number of sites although the fabric is not very fine in comparison to that of Haryana and western Uttar Pradesh (*See map*). The Gandhara Grave Culture (Period I & II) represents a stage of plain grey ceramic tradition which is anterior to the time-span of the Painted Grey Ware Culture. It is the Period III of Gandhara Grave culture which seems to be contemporary to the Painted Grey Ware in Punjab.

Thapar has postulated a plain Grey Ware stage in connection with Indo-Aryan problem in these intermediate regions (*Thapar, 1977*). Stacul has also suggested a culture-interaction between Swat valley, Kashmir valley and China on the basis of underground pit-dwellings, jade beads and burnished Grey Ware (*Stacul, 1977*). There is no denying the fact that when late Harappans were present in Punjab (including Pakistan), Gandhara Grave Culture in Swat valley and Burzahom II in Kashmir valley were also flourishing at the same time. This is very striking and as such it appears that if there is any culture contact of Late Harappans in this region it could be only with Gandhara Grave people and also with Burzahom II. The types of Harappan affinities in these cultures have already been outlined elsewhere.

The term Degenerate Siswal, an evolved stage of Late Siswal has recently been suggested by Suraj Bhan (1977) in the cultural sequence of Haryana. The basis of the equation and classification of Late Siswal with Mature Harappa and Degenerate Siswal with Late Harappa is not at all convincing. Moreover, other cultural traits of Late and

Degenerate Siswal phases were never separated stratigraphically, or found in the excavations at Siswal. Mere paucity of shapes and painted designs do not warrant to call Degenerate Siswal as a separate phase.

The OCW found at a number of sites including Bargaon, Hastinapura, Ahichchhatra, Ambkheri and Atranjikheda has been described by a few scholars as degenerate Harappan Ware (*Ghosh, 1965; Sharma, 1961*). Rao has assigned a date to the whole late Harappan Culture complex including ochre coloured ware of Sutlej and Gangetic valleys to the period ranging from c. 1700-1500 B.C. (*Rao, 1973*). As already explained, except some form of culture contact in upper doab, the ochre-coloured ware has nothing to do with late Harappans, although both the cultures were flourishing at the same time (*Dikshit, 1973, 1977*). If OCP is a degenerate Harappan ware then why not the Harappan sherds noticed at more than fifty sites in Upper Doab were also rolled and weathered like their OCP counterpart? On the contrary, if late Harappan and OCP users are not contemporary and OCP is later, then why the flood or deluge which might have covered the whole of upper doab (*Lal, 1968*) has not effected the earlier existing Harappan pottery lying on the same sites? It clearly shows that the manufacturing technique of late Harappan ware was different from that of OCP, although Dr. Lal (1971-72) calls OCP as a well-fired pottery. The only explanation to these questions is that both these wares are of different tradition and cannot be called as the off-shoot of one single culture.

The Harappan contact in Maharashtra requires more material such as some characteristic Harappan pottery forms for study. As a few of these forms have already been reported from Tapti valley, there is every possibility to encounter them at Daimabad although in a restricted manner. The painted designs of Savalda pottery—Period I noticed in the earliest deposit such as parallel wavy lines connected to a horizontal band, hatched diamond and triangles can be compared with the similar designs found in Rangpur IIC and III. The statue of this pottery *vis-a-vis* neolithic hand made grey pottery found at this site and also at Songaon requires further clarification by excavations at a few other sites.

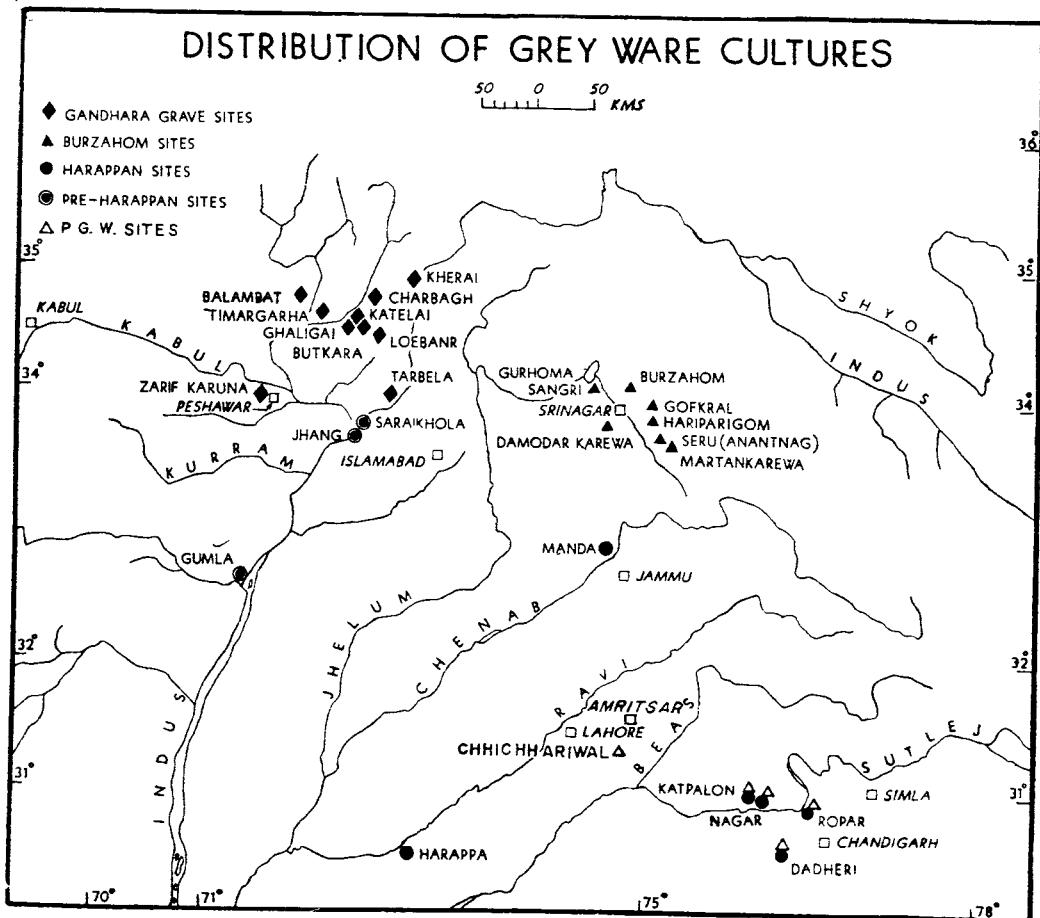
Emergent Picture

The survey of Late Harappan Cultures confirmed that the Harappa culture devolved into late cultures but at the same time the precise nature of development and transformation of Harappan cultural traits which differed from region to region has still to be worked out. There is a widespread degeneration and decay in the cultural traits. The typical Harappan form—tall storage jar with a prominent flange for a lid and characteristic painted motifs—noticed in the excavations at Harappa, Mohenjo-Daro, Lothal and Kalibangan are absent in late Harappan complex. So is the case with triangular terracotta cakes, inscribed seals, a general scarcity of copper and bronze objects, absence of large burnt-bricks houses, granaries and communal hearths and finally the absence of grid-pattern of settlement for which Harappans were well known. The supply of other items such as chert, lapis lazuli, gold etc. was at its lowest ebb which clearly shows a set back to internal and external trade contacts.

The transformation of Harappa Culture in Gujarat and Saurashtra is already an accepted phenomenon but in north India this picture has emerged only in recent years.

The Gandhara Grave Culture and Burzahom are only Grey ware using cultures which

are contemporary to the Harappans in Panjab (including Pakistan). Other cultures like Gandhara Grave Culture Period III and Painted Grey Ware including successive Grey Ware of Northern Black Polished Ware period seem to be contemporary and are chronologically much later for any possible co-relation with late Harappan culture specially in Jammu and Kashmir.



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Harappan Pottery

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J. S. NIGAM

THE HARAPPAN Pottery, broadly speaking, is termed as black-on-red ware. But this term gives an unrealistic idea because the collection of pottery has four categories viz., red ware, buff ware, grey ware and the black-and-red ware. Of course the black-and-red ware is confined to Kutch and Saurashtra regions alone. The percentage of painted pottery does not constitute more than ten per cent of the total yield of the pottery. This contention is based on the author's field study of the excavated pottery at Kalibangan. The paintings occur in black on the red surface, chocolate or purple-black on the buff surface and white or creamy on the black surface of the black-and-red ware. The grey ware does not bear paintings and the percentage of this ware is fairly low. The red, buff and grey wares are in two fabrics *i.e.*, fine and coarse. A further classification is made on the basis of application of the slip or its absence, and also on the basis of the thickness of the sections or body of the pottery. The black-and-red ware is usually of fine fabric and thin section. The clay used by the Harappan Potters was of fairly good quality and generally well levigated as is revealed by the cohesion of the clay particles. There has been a proportionate mixing of the tempering materials such as sand, lime or mica in the clay. But certain specimens do not indicate use of degraissant. Regarding grey ware Hamid's view is that the clay used for producing this ware contained ferious oxide. The pottery on the whole is wheel-turned with a few sporadic handmade specimen. Regular and dense striations indicate potting on a fast spinning wheel. The thread cut marks at the bottom of certain pots provide a convincing clue that the wheel was rotated from both the sides *i.e.*, clock-wise and anti-clock-wise. Some of the pots were made in parts and later luted together off the wheel or on the wheel with a very slow momentum.

About fifty per cent pottery was dressed by way of applying slip. The red ware constitutes the majority. In this class the fine pottery bears slip which was obtained by application of red-oxide. The other slips on the Harappan Pottery are creamy ranging from whitish to yellowish hues, chocolate or purplish. Quite a few specimens show the use of two slips on a vessel, *viz.*, red and creamy, red and chocolate or creamy with chocolate. Application of these slips-red, creamy and purplish is rarely met. The grey ware was rarely treated with black slip. The pottery also bears wash in red, creamy and rarely purplish colour.

Broadly speaking the Harappan painted pottery shows the pot-painter's predilection for the geometrical designs. Naturalistic patterns depict the floral and faunal wealth of those times. All the painted motifs are described elsewhere in this paper. The paintings generally occur in registers or zones which normally do not reach below the waist of the vessel. Of course, completely painted pots are not lacking. Decorations obtained by way of incisions are uncommon. Sporadic examples show lunar impressions on the interior surface of the dishes of the dish-on-stand type and some vases. Cord impressions are also met on storage jars and basins. A few pots show the use of barbotine decoration. Another type of ornamentation though rarely met is on the glazed ware. In this case the light grey pottery was treated with dark purplish slip, probably manganese and burnished. The pots were glazed, but before firing this glaze and slip were removed with a multi-pronged implement or a comb to make a decorative pattern of straight or wavy lines. A sub-variety in this class of decoration is known as 'reserved slip'. It was achieved by way of removing the slip thus producing horizontal bands. This sort of treatment was generally confined to lower portion and is also termed as rusticated.

The different ware would suggest various methods of firing. By and large the Harappan pottery is very well fired. But the kiss-marks, black blotches, and cramped pots do indicate bad firing. Underfired pot has not come to notice. The red ware including various shades of red and buff ware was fired in the fully oxidizing conditions. "in round domical kilns with perforated floors". The grey ware, though contained ferous-oxide may have been fired under the reducing condition, i.e. not sufficient oxygen was permitted in the kiln. About black-and-red ware, there are various views. The ware is being subjected to various examinations in the laboratories. The time honoured view of Lucas is that it is the result of the inverted firing.

The Harappan Pottery on the basis of shapes can broadly be classified into four groups
A. The shapes which are met only in the Harappan civilization. These include goblets, beakers, perforated jars, certain types of jars, and vases etc. *B.* In this group can be placed such shapes which occur in the pre-Harappan cultures and continue in the post-Harappan period in association with other cultures. Here are such common shapes viz., dish-on-stand, cup-on-stand, bowls, dishes, basins, caskets, vases, jars, lids and ring-stands etc. *C.* Zoomorphic containers, and *D.* The black-and-red ware.

Group A

Goblets : The goblets are of two varieties. In the first variety are such specimen which are akin to modern *Kulharh* where the middle portion is normally scored and the base is either pointed, or incipient, rendering the vessel unable to stand on its own. It has been suggested that these may have been put on some sort of wooden stands which have not survived. But this view cannot be accepted. The pottery ring-stands are not in such great numbers or whatever the specimens of these ring-stands have come to light, their size does not warrant the use for the goblets. The goblets were used for drinking water or any other liquid and once used were discarded as is prevalent even today in India with regard to the *Kulharhs*. These must have been put upside down individually or piled up in the same position. The scoring in the middle is to provide easy grip. Most of these are devoid of slip but several specimens bear thin creamy wash. These have been found in all the Harappan sites.

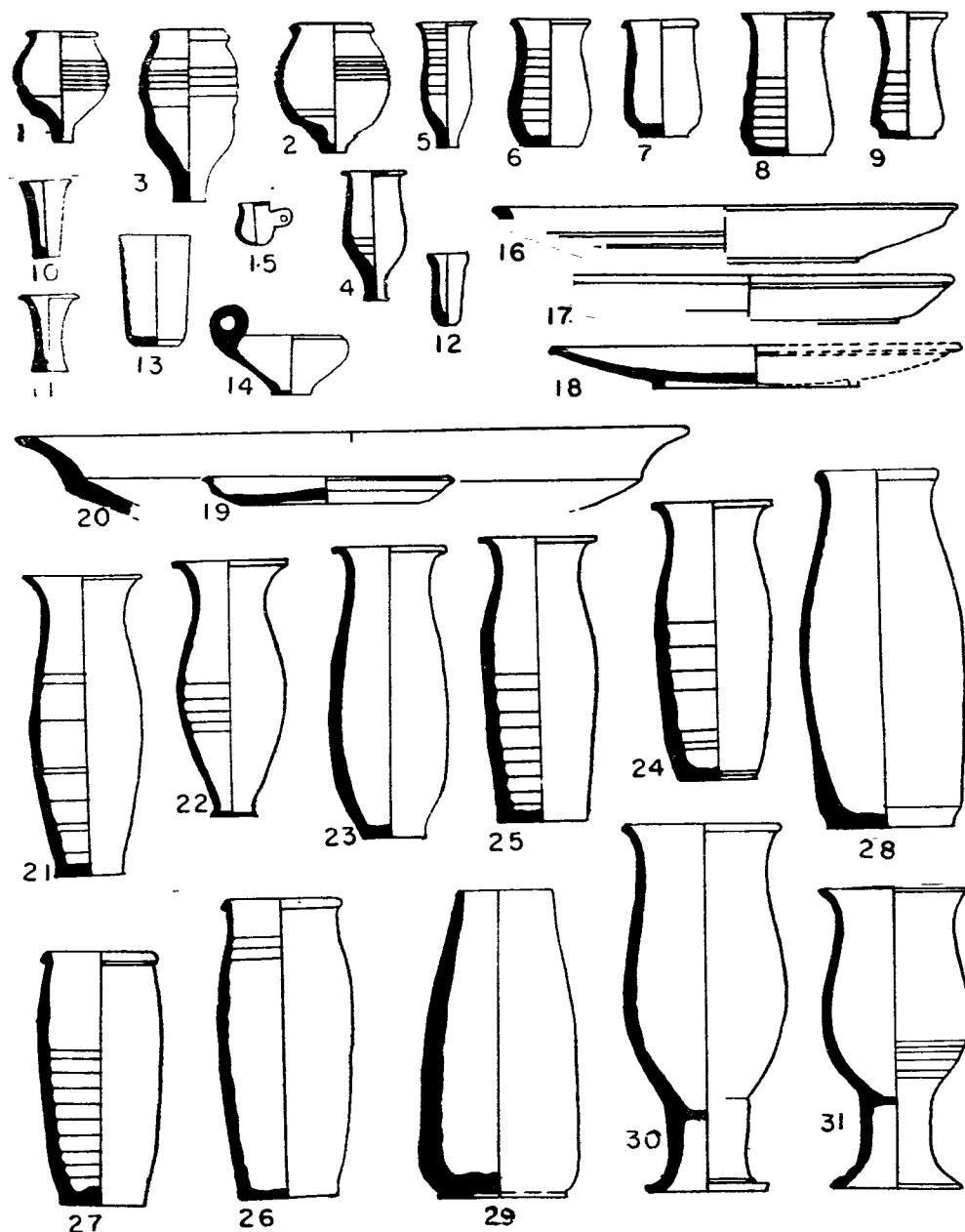


Fig.-1

Fig. 1

1. It has a flaring mouth, externally beaked rim, short concave neck and slightly bulging profile which is scored in the middle. The lower portion is thicker ending in a solid stud base. From Mohenjo-Daro.

2. It has a flaring mouth, thickened and externally obliquely cut rim, short concave neck and bulging profile which is scored in the middle. The lower portion is thicker ending in a short solid base. From Mohenjo-Daro.

3. It has a wide mouth, thickened and externally obliquely cut rim, constricted neck and slightly elongated profile which is corrugated within and scored outside in the middle. The lower portion is thicker ending in a solid stud base. From Mohenjo-Daro:

The other type of goblet is of a more graceful form. It is slightly elongated and is provided with a narrow solid stemmed base, generally called the button base goblet. It usually bears buff slip and a number of examples show parring marks.

4. It has a wide mouth, horizontally splayed rim, almost vertical sides ; the lower half is convex ending in a solid stemmed base. From Mohenjo-Daro.

5. It has a flaring mouth, concave-convex profile interiorly corrugated ending in a solid stemmed base. From Mohenjo-Daro.

Beakers : The term beaker is a misnomer as none of the specimens examined so far bear a beak. However, their similitude minus the beak to the modern glass beaker is the reason to christen these as beakers. Like the goblets the beakers were also used as drinking vessels as is indicated by these forms. It would be better if these are named as tumblers. They occur in different shapes and sizes. These are generally devoid of slip but mostly treated with buff or creamy wash of different consistency. They occur in all the Harappan settlements.

6. It has a flaring mouth externally obliquely cut rim, concavo-convex profile interiorly corrugated and flat base. From Mohenjo-Daro.

7. It has a wide mouth externally thickened rim tapering sides with slight concavity below the rim and narrow thick foot base. From Mohenjo-Daro.

8. It has a flaring mouth, 'S' twist profile having corrugations in the lower half and wide foot base. From Mohenjo-Daro.

9. It has a flaring mouth and hour-glass profile, the lower half is corrugated inside forming a ledge near the foot base. From Mohenjo-Daro.

Tumblers : The tumblers are not a very popular type in the classical Harappan sites. Only a few specimens have come to light at Harappa. Most of these have been found at Chanhudaro. These show crude workmanship and bear no slip, but parring marks. Both wheel-turned and handmade examples are available. It is needless to say that the tumblers were used as drinking vessels.

10. It has a flaring mouth, flaring sides and thick flat base. From Harappa.

11. It has a flaring mouth, externally bevelled rim and concave sides, thick flat base. From Harappa.

12. It is rather a crude example, has flaring mouth and infirm flat base. From Harappa.

13. It is akin to a modern tumbler still used in the Indian houses, has a wide mouth and flat base. From Harappa.

Handled bowls : These have a ring handle with a perforation to fasten it with the finger for an easy grip like the modern tea-cup or mug. These are usually wheel-thrown but hand made specimens are not lacking. The handle is luted at the rim. They are of medium to coarse fabric and treated with creamy or red wash.

14. It has an incurved rim with flaring sides and disc base. The ring-handle is luted at the top. From Mohenjo-Daro.

15. It has a short vertical rim and bulging profile. The ring-handle is luted below the rim. From Mohenjo-Daro.

Dishes : The dishes are a common shape. But here the typical Harappan dishes are described. These are made of medium to fine clay and very often treated with red or creamy slip invariably inside and often outside. They are also sometimes painted inside.

16. It has an everted rim, concave neck carination below, flaring sides and disc base. Inside is painted in black with concentric circles. From R-37 Harappa.

17. It has a nail-head rim, flaring sides, disc base. Inside is painted with a circle. From R-37 Harappa.

18. It has a square cut rim, flaring sides and ring base. From Mohenjo-Daro.

19. It has a nail-head rim, slight concavity below and thick convex base. From Mohenjo-Daro.

20. It is a wide dish having obliquely splayed rim and carination below. From Alamgirpur.

Medium size vases : Various shapes are met in the medium size vases, (i) those with elliptical form have flaring mouth, flat base and are normally treated with creamy slip, (ii) those which have cylindrical body, flaring mouth, flat base and are coarse, generally bear thin creamy slip. The corrugations inside are prominent, (iii) such vases which have flaring mouth and hollow pedestal base.

ELLIPTICAL VASES

21. It has a flaring mouth, slightly externally thickened rim, concave neck, elliptical profile and flat base. The interior is rough showing undulations. From Mohenjo-Daro.

22. A variant of the above, differs in having a narrow base. From Mohenjo-Daro.

23. A variant of 21, differs in having 'S' twist body. From Mohenjo-Daro.

CYLINDRICAL VASES

24. It has a flaring mouth, externally thickened rim, concave neck, elongated body and ring base. The interior is rough showing undulations. From Mohenjo-Daro.

25. A variant of the above, differs in having a flat base. From Mohenjo-Daro.

26. It has an externally thickened and obliquely cut rim vertical neck slightly,

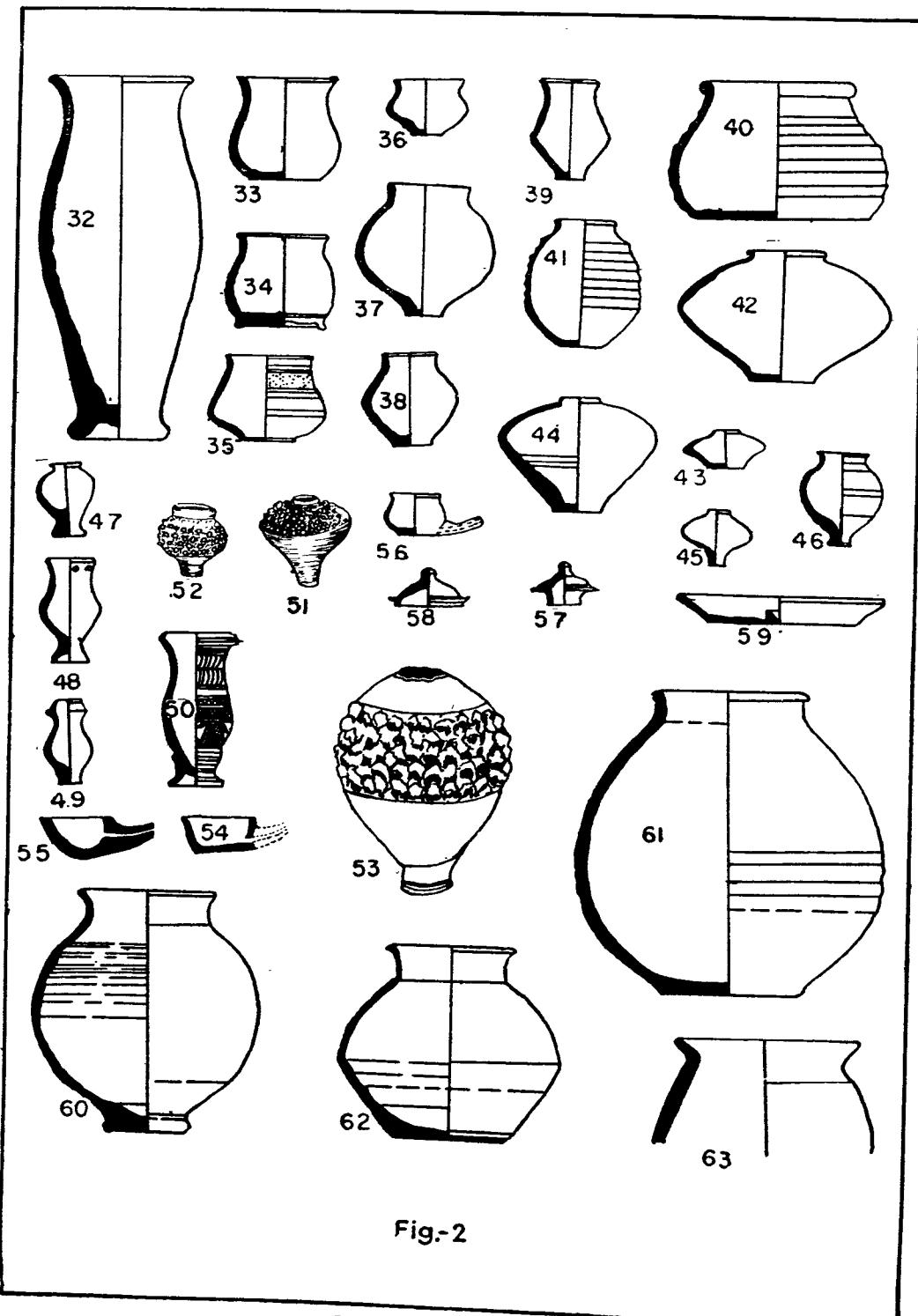


Fig.-2

[See Captions on p. 141]

bulging shoulders, cylindrical form and flat base. The prominent corrugations inside indicate rough potting. From Mohenjo-Daro.

27. It has an externally thickened rim with cylindrical form, flat base which has mild concavity above and the bottom inside is convex. From Mohenjo-Daro.

28. It has an externally thickened rim, concave neck, receding shoulders, cylindrical body and flat base which has mild concavity above. From R-37 Harappa.

29. It is a variant of the above, differs in having a featureless rim and tapering sides. From R-37 Harappa.

Vases with pedestal base : These are high vases with a conspicuous hollow pedestal base. This type is confined to the Cemetery R-37 at Harappa.

30. It has a flaring mouth, concave neck, slightly bulging profile in the middle and pedestal base with flaring edge and a mild ridge above.

31. It is a variant of the above, differs in having convex profile and a higher pedestal base.

Fig. 2

32. It has a flaring mouth, concave neck, elliptical profile and short pedestal base.

OTHER TYPES OF VASES

Vases with globular profile : The vases of this group have a wide mouth and are distinguished by their globular profile. They are met in red, buff and grey wares bearing slip.

33. It has a flaring mouth, concave neck, convex belly and flat base. From Mohenjo-Daro.

34. A variant of the above, differs in having a ridge above the ring base. From Mohenjo-Daro.

Wide mouth vases : The salient feature of the type of vases in this group is that their width is more than their height. Both coarse and fine variety has been found. They bear slip and paintings besides being plain.

35. It has a flaring mouth, constricted neck, splayed shoulders carination at the waist and disc base. It is painted with horizontal lines in black over the slipped surface. From Mohenjo-Daro.

36. It has a splayed out rim, concave neck, carination at the waist and flat base. From Chanhudaro.

Vases with narrow base : The characteristic feature of these vases are a wide mouth, bulbous body and narrow base. These are coarse and sometimes bear slip or wash.

37. It has a wide mouth, featureless rim, vertical neck, convex profile and narrow disc base. From Mohenjo-Daro.

38. A variant of the above, differs in having mild carination at the waist. From

Mohenjo-Daro.

39. A variant of the above, differs in having a slim body. From Mohenjo-Daro.

Fluted vases : The medium size vases have fluted exterior and are of medium fabric, generally treated with pink or red slip on the outside. They are confined to Indus valley. They have been recovered in a very limited number.

40. It has a flaring mouth, externally clubbed rim, concave neck, convex profile abruptly ending in a flat base. The exterior is horizontally fluted. From Mohenjo-Daro.

41. It has an outcurved externally bevelled rim, globular profile and flat base. The exterior from the shoulder upto the waist is fluted. From Harappa.

Vases with wide shoulder : The distinguishing feature of these vases is that the shoulder is very broad. They are made of ordinary clay and generally the upper part only bears slip.

42. It has an out going rim, constricted neck, wide shoulders, carination at the waist and disc base. From Mohenjo-Daro.

43. A miniature variant of the above, differs in being more wide than tall. From Mohenjo-Daro.

44. It has a narrow mouth, short vertical rim, the shoulder begins below the rim, the carination is at a high point, the base is flat. From Mohenjo-Daro.

45. A miniature variant of the above, differs in having a stemmed base. From Mohenjo-Daro.

Vases with foot base : A number of small vases with diverse shapes have a common trait of having a solid or hollow pedestal base. Some of the examples are painted. A good number of them bear perforations at the rim to be kept suspended. They may have been used for keeping perfumes, costly oils or medicines etc.

46. It has a flaring mouth, concave neck, convex profile ending in a short stemmed base. The exterior is painted with horizontal lines in black. From Mohenjo-Daro.

47. It has an out-turned rim, globular profile and solid stemmed base. From Mohenjo-Daro.

48. It has a flaring mouth, concave-convex profile and hollow pedestal base. The holes below the rim suggest that it was also kept suspended. From Mohenjo-Daro. Similar types found at Harappa and Chanhudaro do not have hole.

Vases with recurved profile : The small size of vases having recurved profile have been recovered in a very limited number. They bear slip and some of them are also painted. A specimen from Mohenjo-Daro is akin to a bronze kohl container obtained from the same site, suggests that these vases were used for a similar purpose.

49. It has a closing mouth, ridge below, concave neck, convex sides ending in a solid stem base. From Mohenjo-Daro.

50. It has an inturned rim, 'S' twist profile, and hollow pedestal base. The whole of the exterior is painted. From Chanhudaro.

Vases bearing knob decoration : The small size of vases have a globular profile and narrow base. They occur both in red and grey wares and treated with slip of the respective colour. The knob decoration is confined to the upper part of the vessels. The narrow stemmed base suggests that they would have been put on ring stand. The narrow mouth suggests that some liquids were kept in them.

51. It has a narrow mouth, short vertical rim, wide shoulders, receding profile, and stemmed base. The upper part has knob decoration From Mohenjo-Daro.

52. A variant of the above differs in having a vertical rim and globular profile. From Mohenjo-Daro.

53. A variant of the above being bigger in size, differs in having knob decoration in the middle. From Mohenjo-Daro.

Feeders : The feeders are not a common type. They have been recovered from several Harappan sites. As the term implies these appear not to have been used for feeding the children as is suggested by their limited number. Presumably these were used for administering medicine to the ailing. They have also been taken to be smoking pipes but their size and absence of any traces of burning rule out the possibility. A tubular spout had been luted at the base level of an elliptical bowl or a miniature vase. The bowl types are handmade. The feeders generally bear a creamy wash and are occasionally slipped as well.

54. It has flaring sides and flat base. A hole is cut at the base for the feeding spout. From Chanhу-Daro.

55. It has flaring sides and rounded base, the spout is luted slightly above the base. From Chanhу-Daro.

56. It has an everted rim, convex profile and disc base. The spout is luted at the base. From Mohenjo-Daro.

Lids : Various types and shapes are met in the lids. But the typically Harappan forms are described below. Other common type of lids are discussed under *B* group.

57. It has a central knob at the top, projected sides and vertical tang to pass into the mouth of the vessel. The projection rests on the rim of the pot thus covered. From Mohenjo-Daro.

58. A variant of the above, differs in having a short tang. From Mohenjo-Daro.

59. It has flaring sides and flat base. A hollow open knob handle is luted in the centre inside. From Mohenjo-Daro.

Miscellaneous jars : Various shapes and types are met in the jars. These are sturdy built, of medium fabric and generally treated with creamy or red slip or wash. These must have been used for storing water or other liquids. However, they may also have been used for storing grains as well. These would have been used as containers for commercial packing. They occur in buff and red wares and rarely in grey ware and are normally devoid of decoration except cord impressions on the exterior. Some of them had been recovered from the burials.

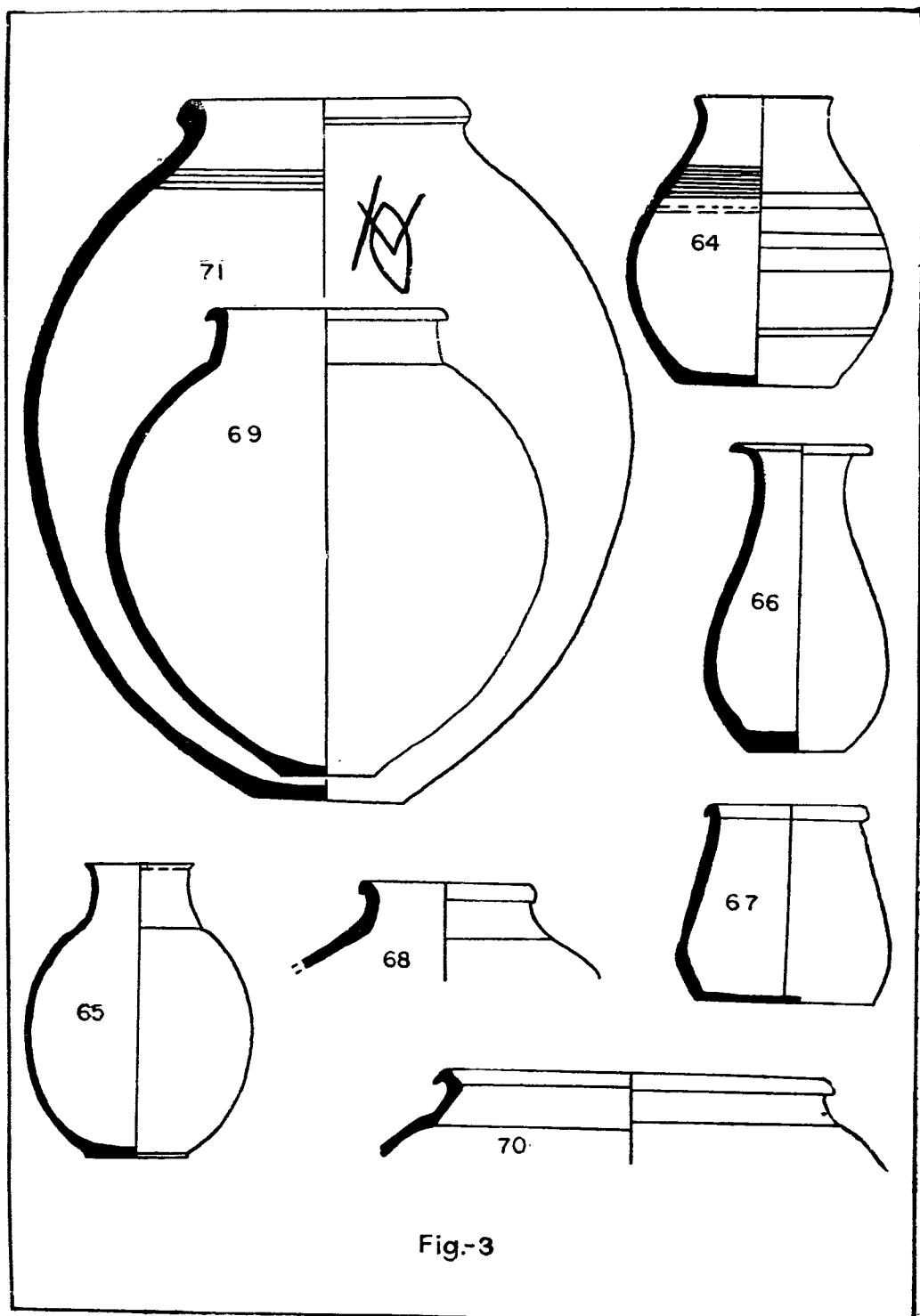
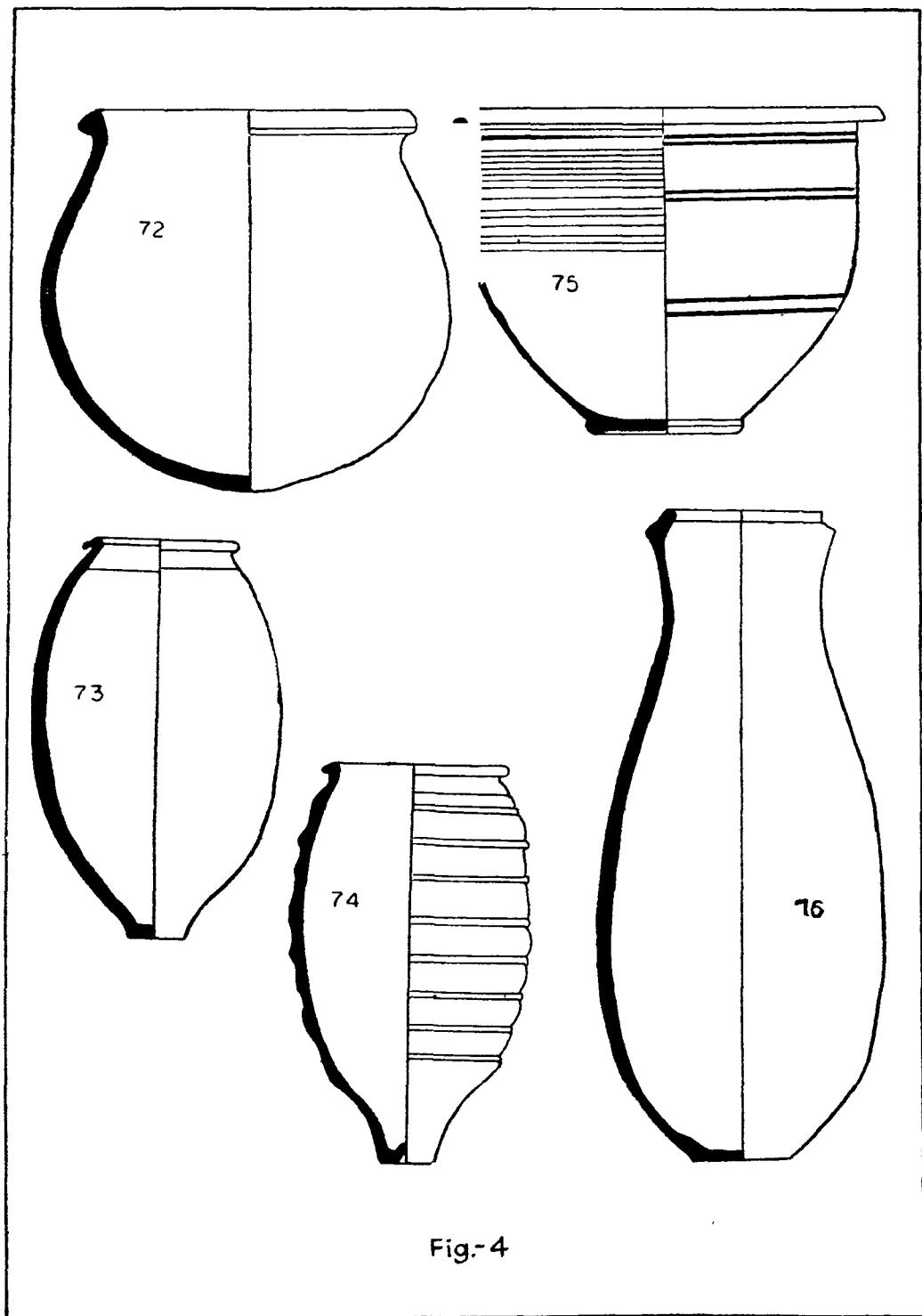


Fig.-3

[See Captions on p.146]



[See Caption on p. 146]

60. It has a flaring mouth, concave neck, globular profile and foot base. From Kalibangan burial.

61. It has a flaring mouth, externally beaked rim, short vertical neck, bulging profile with flutings and flat base. From Kalibangan burial.

62. It has a wide mouth, externally beaked rim concave neck, carinated profile and flat base. From Kalibangan burial.

63. It has an obliquely splayed rim, constricted neck and bulging sides. From Lothal.

Fig. 3

64. It has a flaring mouth, concave neck, bulging profile abruptly ending in flat base. The exterior is painted with horizontal lines. From Kalibangan burial.

65. It has an everted rim, high concave neck, oval profile and disc base. From Kalibangan burial.

66. It has a horizontally splayed rim and 'S' twist form with flat base. From Kalibangan burial.

67. It has a wide mouth, externally clubbed rim, tapering sides, carination above the flat base. From Mohenjo-Daro.

68. It has an obliquely splayed rim, concavity below and flaring shoulders. From Lothal.

Store jars : In this category fall such big vessels which are quite heavy, thus not making it possible to be moved very often. Their form and size indicate that they were used for storing grains or liquids. Some of them were also used as soakage jars. Their use as cup-boards, safe-vaults or drawing-room pieces is not acceptable. How such big vessels were turned on the wheel is difficult to explain, possibly they were made in parts and luted together very skillfully. The exterior and interior are rendered so smooth that the luting points are not discernible. Generally these have been treated with creamy or red slip on the exterior, but in some examples the interior is given a wash. A few of these jars are also painted. Some of these also had been used in burials.

69. It has an out turned externally flanged rim, vertical neck, globular profile and narrow flat base. From Kalibangan burial.

70. It has a wide mouth, obliquely splayed and flanged rim, oblique neck with a ledge at the shoulder. From Lothal.

71. It has an out going externally clubbed rim, concavity below and oval profile ending in a flat base. It bears graffiti mark. From Kalibangan burial.

Fig. 4

72. It has a beaked rim, wide mouth, globular body and rounded base. From Lothal burial.

73. It has an everted and externally beaked rim, oval profile ending in a narrow foot base. From Mohenjo-Daro.

74. It has an everted externally beaked rim, oval corrugated profile and narrow short pedestal base. From Chanhudaro.

75. It has a wide mouth, horizontally splayed and flanged rim, vertical sides receding down ending in a ring base. It is painted with horizontal lines outside. From Kal-

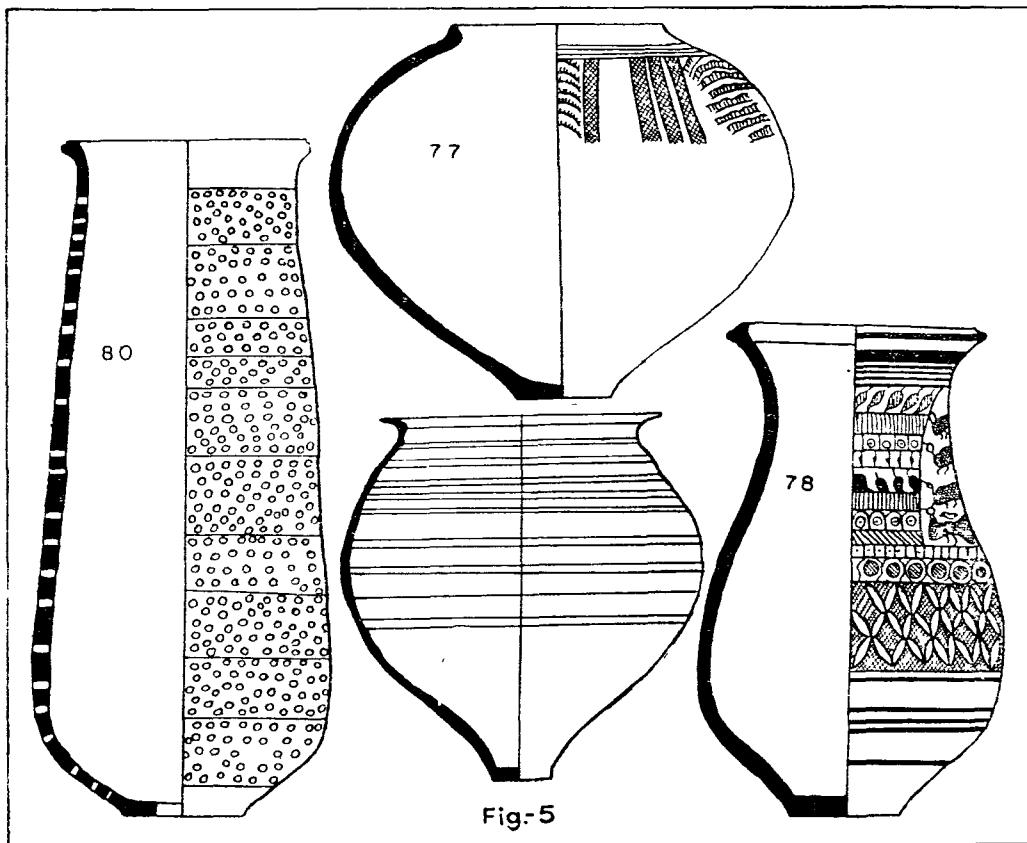
bangan burial.

76. It has a horizontally splayed rim, short concave neck, globular profile ending in a narrow flat base. It is painted with horizontal lines outsides. From Mohenjo-Daro.

Fig. 5

77. It has a bud shaped rim, ledged shoulder, globular profile ending in a foot base. It is painted on the exterior. From Harappa.

Tall storage jars of 'S' twist: A limited number of this type of jars have been found at the Harappan sites. These have invariably been coated with red slip on the exterior and are generally profusely painted in vertical and horizontal registers with geometrical, floral and faunal designs. The graceful curves and uniform section of the vessels evince the high skill of the potters.



78. It has a wide mouth, short closing rim with a ledge on the exterior to receive the lid, 'S' twist profile and narrow disc base. The exterior is richly painted with geometrical and natural motifs. This type of jars has been found at Mohenjo-Daro, Harappa, Lothal and Kalibangan.

79. It has a closing rim with a ledge, 'S' twist profile ending in a flat base. This type of jars has been found at Mohenjo-Daro and Chanhudaro.

Perforated jars: The perforated jars are a characteristic shape of the Harappans.

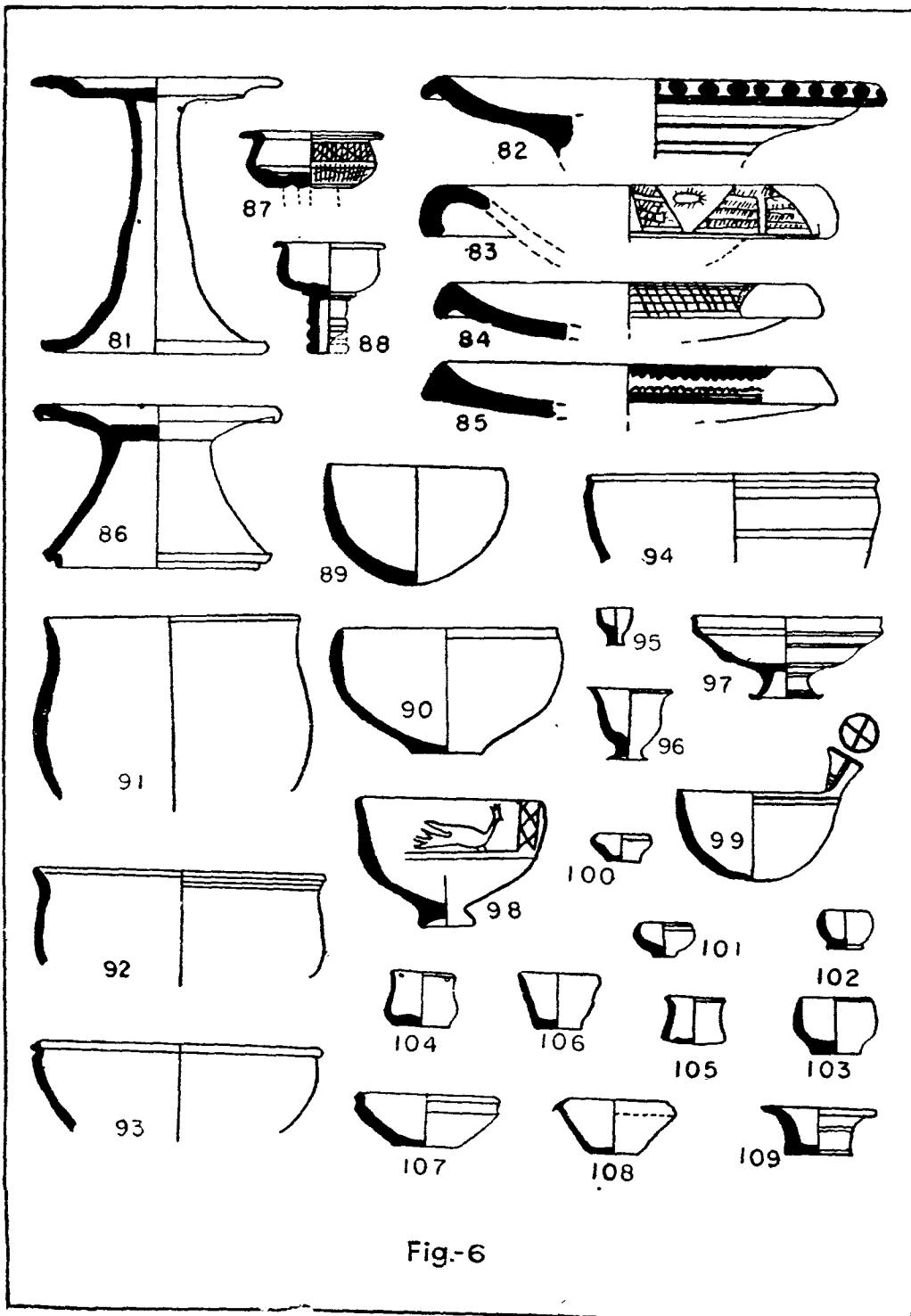


Fig.-6

[See Captions on p. 149]

They are generally tall and cylindrical vessels having a number of perforations of uniform size all over the body, pierced from the outside as is evident from the rugged interior surface. They also usually have a big aperture in the centre of the base. These are sturdy, made on the wheel and usually treated with a creamy wash or thin slip. The shape has ever remained enigmatic. Various uses have been suggested such as incense burners, brazier and fitters. The possibility of being incense-burners or braziers is ruled out as no specimen bears foot-marks. These might have been used as filters. This view is supported by the vessel termed '*Sahasra-dhara*' in Vedic literature. My own interpretation for the use of these perforated jars is that these were used for filtering drinking water. In such a process three such jars would have been put one upon the other. The lower jar being slightly bigger than the upper in each case. The first to third perforated jar would have contained charcoal, kankar and sand respectively. A storage jar at the bottom was to receive the filtered water or any liquid. Similarly some of the smaller perforated vases may have been used for filtering pharmaceutical herbal pastes.

80. It has an out curved rim, wide mouth, cylindrical tapering body bearing multiple perforations and flat base with a big aperture. These occur at all the Harappan sites and are also available in medium to miniature sizes.

Group B

Offering-stands : The offering-stands are of common occurrence with the Harappans. But they are well known in the pre- and- post Harappan cultures of the sub-continent. They are made of fine to medium fabric in red, buff and rarely in grey were and most of them are treated with a slip and painted. All the specimens are wheel thrown and made into two pieces. The stem including the base are in one piece and the upper part is prepared separately and luted together as is evident by the key-marks below the dish part. Mostly the stems are plain, but some of these bear paintings, mouldings or corrugations. They are divisible into the following sub-varieties viz., (i) tall-stemmed, (ii) squat stemmed, and (iii) cup-on-stand or chalice.

Fig. 6

81. It has splayed out rim, carination at the waist and flat bottom. The tapering stand has flaring edge. From Mohenjo-Daro.

82. It has an out turned flanged rim, flaring sides. The exterior is painted with a zone of solid circlets and several horizontal lines. From Alamgirpur.

83. It has a drooping rim which is exteriorly painted with registers of mono-pinnats and sun design. From Alamgirpur.

84. It has an out curved rim which is painted with checker design. From Alamgirpur.

85. It has a nail-head rim which is painted with horizontal wavy lines. From Alamgirpur.

86. It has flaring sides and an out curved rim, short tapering stand with a notched edge. From Mohenjo-Daro.

87. It has horizontally splayed rim, convex profile. The stem and the base is broken. It is painted on the exterior. From Mohenjo-Daro.

88. It has an out curved flanged rim and convexity at the waist, a ridge below and

several on the stem. From Mohenjo-Daro.

Bowls : The bowls are of different shapes and sizes. Broadly these can be divided into four groups viz., (i) convex sided, (ii) having short stemmed base, (iii) stud-handled and (iv) other types of bowls.

Convex sided : The bowl of this class occur in red, buff black-and-red and Micaceous Red Wares. Generally they are wheel-made but hand-made examples are also found. Application of slip or wash is noticed ; the paintings are rare. These were not popular in the Indus valley.

89. It is sub-spherical in form, has externally thinned rim and rounded base. From Lothal.

90. It has convex sides, featureless rim and flat base. From Lothal.

91. It has a wide mouth, flaring rim, and convex sides. From Lothal.

92. It has an out curved thickened rim and convex sides. From Lothal.

93. It has externally clubbed rim and receding convex sides. From Lothal.

94. It has an everted internally ledged rim, and receding convex sides. From Lothal.

Short stemmed base : The bowls having short stemmed base which is either solid or hollow are a distinguishing feature of this sub-variety. Both wheel-made and handmade examples have come to light. Some of them bear a slip and are also painted.

95. It has short vertical sides and stemmed base. From Mohenjo-Daro.

96. It has a flaring mouth, and stemmed base which has convexity at the bottom. From Mohenjo-Daro.

97. It has short vertical rim, flaring sides having grooves inside and ridges outside and short hollow pedestal base. From Mohenjo-Daro.

98. It has a wide mouth, almost vertical sides with mild carination at the waist and short pedestal base. It is painted with a peacock on the exterior. From Rangpur.

Stud-handle bowls : In this category fall such bowls which have stud handles and are confined to Gujarat. These are both in red slipped and black-and-red wares and often bear paintings. The stud handle has been luted vertically on the top of the rim.

99. It has an internally thinned rim, convex profile, round base. A stud handle is obliquely luted at the top. It is painted with two rim bands ; the handle is also painted with horizontal lines and a cross at the top. From Rojdi. Similar bowls have been found at Lothal.

Other types of bowls : In this class are grouped various types of bowls which differ in shape and size. Some of them are handmade. They are generally not well finished and devoid of decoration.

100. It has an incurved rim, flaring sides and flat base. From Chanhudaro.

101. It has featureless rim, convex sides and disc base. Painted with horizontal lines

on the exterior. From Mohenjo-Daro.

102. A variant of the above differs in having foot base. From Mohenjo-Daro.
103. It has an externally thinned rim, almost vertical sides and thick disc base. From Mohenjo-Daro.
104. It has featureless rim, concavity below, mild carination and thick flat base. It has holes below the rim for suspension. From Mohenjo-Daro.
105. A variant of the above differs in having a flaring mouth and rounded base. From Mohenjo-Daro.
106. It has flaring sides and thick flat base. From Mohenjo-Daro.
107. It has an externally bluntly bevelled rim, concavity below, thick flaring sides and flat base. From Mohenjo-Daro.
108. It has nail-head rim, flaring sides and flat base. From Chanhу-Daro.
109. It has a flaring mouth, vertical sides and flat base. From Chanhу-Daro.

Dishes : The dishes have been found at all the Harappan sites and is a very common type. They occur in various shapes and sizes. These are met in buff and red wares and generally the inner surface is well finished.

Fig. 7

110. It has flaring sides, featureless rim and rounded base. From Mohenjo-Daro.
111. It has vertical thick sides, featureless rim, mild carination at the waist and rounded base. From Chanhу-Daro.
112. It has flaring sides clubbed rim with a ledge on the exterior and rounded base. From Chanhу-Daro.
113. It has flaring undulating sides and foot base. From Mohenjo-Daro.
114. It has a splayed out rim with a mild ridge inside, flaring sides and foot base. From Mohenjo-Daro.
115. It has an everted rim, concavity below, bold ridged carination at the waist. From Mohenjo-Daro.

Pans : They are made of fine clay and met both in buff and red wares. Generally red slipped on both the sides, certain specimens show use of buff slip on the exterior and red slip on the interior. Pans of these shapes are still used in Northern India; they are also made in stone.

116. It has a thickened rim with a groove inside, flaring sides and flat base. From Mohenjo-Daro.
117. It has an externally flanged rim, flaring sides and flat base. From Mohenjo-Daro.
118. It has an everted rim, concavity below carination at the waist for the flat base. From Mohenjo-Daro.
119. It has an out curved featureless rim, concave sides, ridged carination for the flat base. From Mohenjo-Daro.

Handis : The handis of the Harappans bear a ridge on the shoulder. But the distingui-

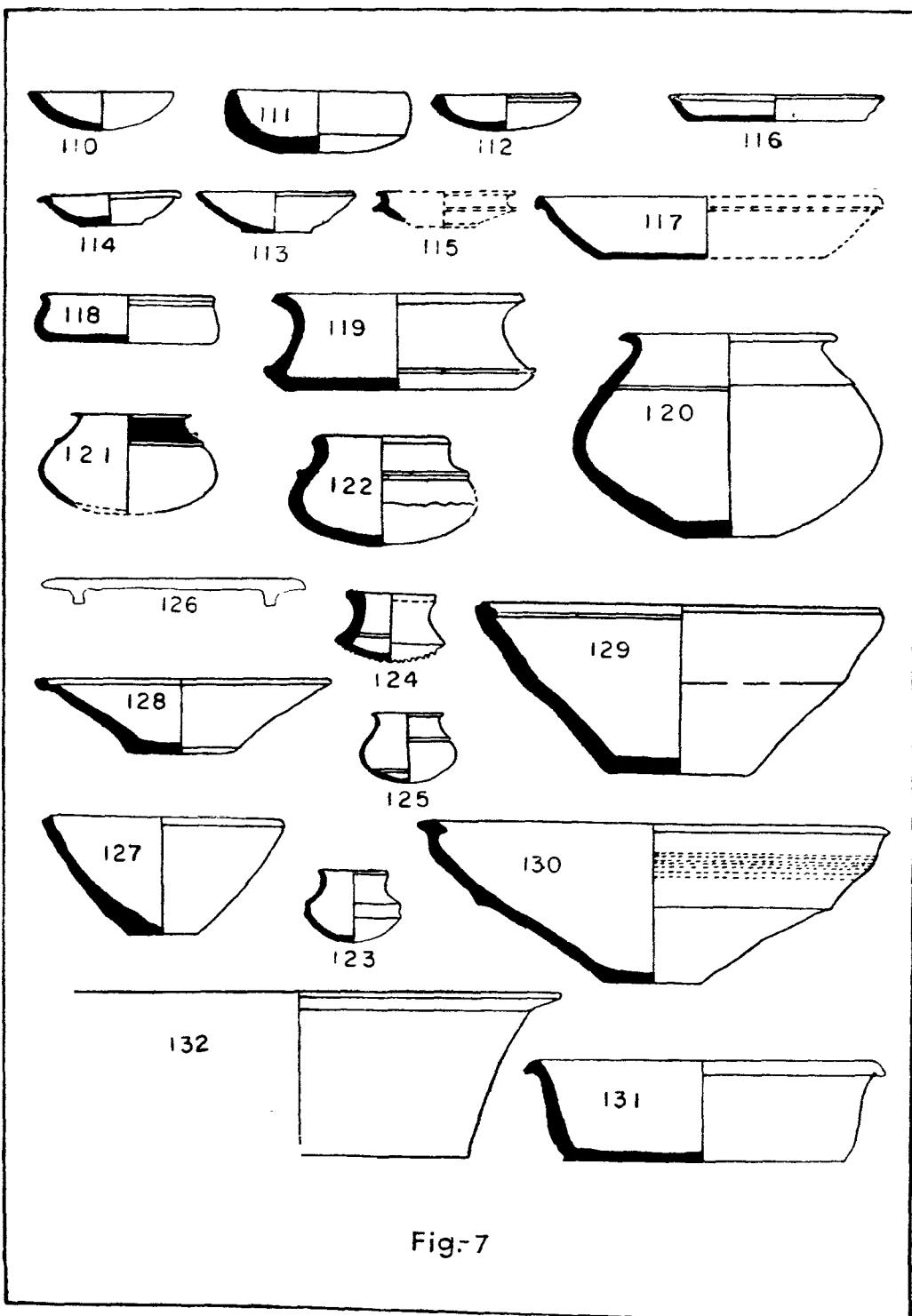


Fig.-7

[See Captions on p. 151]

shing feature of these is the application of bichrome slip. The slip above the ridge is dark and the combinations of dark red with pink or chocolate with cream are found.

120. It has an out curved rim, wide mouth, ridge at the shoulder, mild carination at the waist and flat base. From Mohenjo-Daro.

121. A variant of the above has a band painted on the shoulder. From Mohenjo-Daro.

122. It has an everted externally bluntly bevelled rim, ridge at the shoulder, carination at the waist and rounded base. From Chanhу-Daro.

123. It has wide mouth, externally bevelled rim, two carinations at the waist and rounded base. From Chanhу-Daro.

124. It has a thickened rim flattened at the top, carination at the waist and rounded base. The bottom is rough. From Mohenjo-Daro.

125. It has a wide mouth externally beaked rim, ridge at the shoulder and rounded base. From Mohenjo-Daro.

Chapati plate : It is a thick plate with flat top surface provided with at least three legs on which it rests. It was used for shaping the dough to make *chapati*. This sort of plates are still common in the wheat or barley consuming areas of North India.

126. It has a flat top, round in shape with three short legs. From Mohenjo-Daro.

Basins : The basins present different shapes and sizes and poor workmanship; of course finer examples are not lacking. Some of them are painted. The type 132 may have been used even as a bath tub.

127. It has an externally obliquely cut rim, flaring sides and flat base. From Mohenjo-Daro.

128. It has a thickened rim with a depression inside, flaring sides and flat base. From R-37 Harappa.

129. It has internally clubbed rim, flaring sides and flat base. From Kalibangan burial.

130. It has a nail-head rim, flaring sides having a mid rib and flat base. The exterior has several rows of cord impressions. From Chanhу-Daro.

131. It has an externally flanged rim, flaring sides and flat base. From Mohenjo-Daro.

132. It has an out going rim flattened at the top, flaring sides and flat base. From Mohenjo-Daro.

Fig. 8

133. It has an out curved rim, thick convex sides thinning towards the base. From Alamgirpur.

134. It has splayed thickened rim with a ridge inside and convex sides. The upper part of the rim is painted. From Alamgirpur.

Miscellaneous vases and jars : These have been recovered from various sites and differ

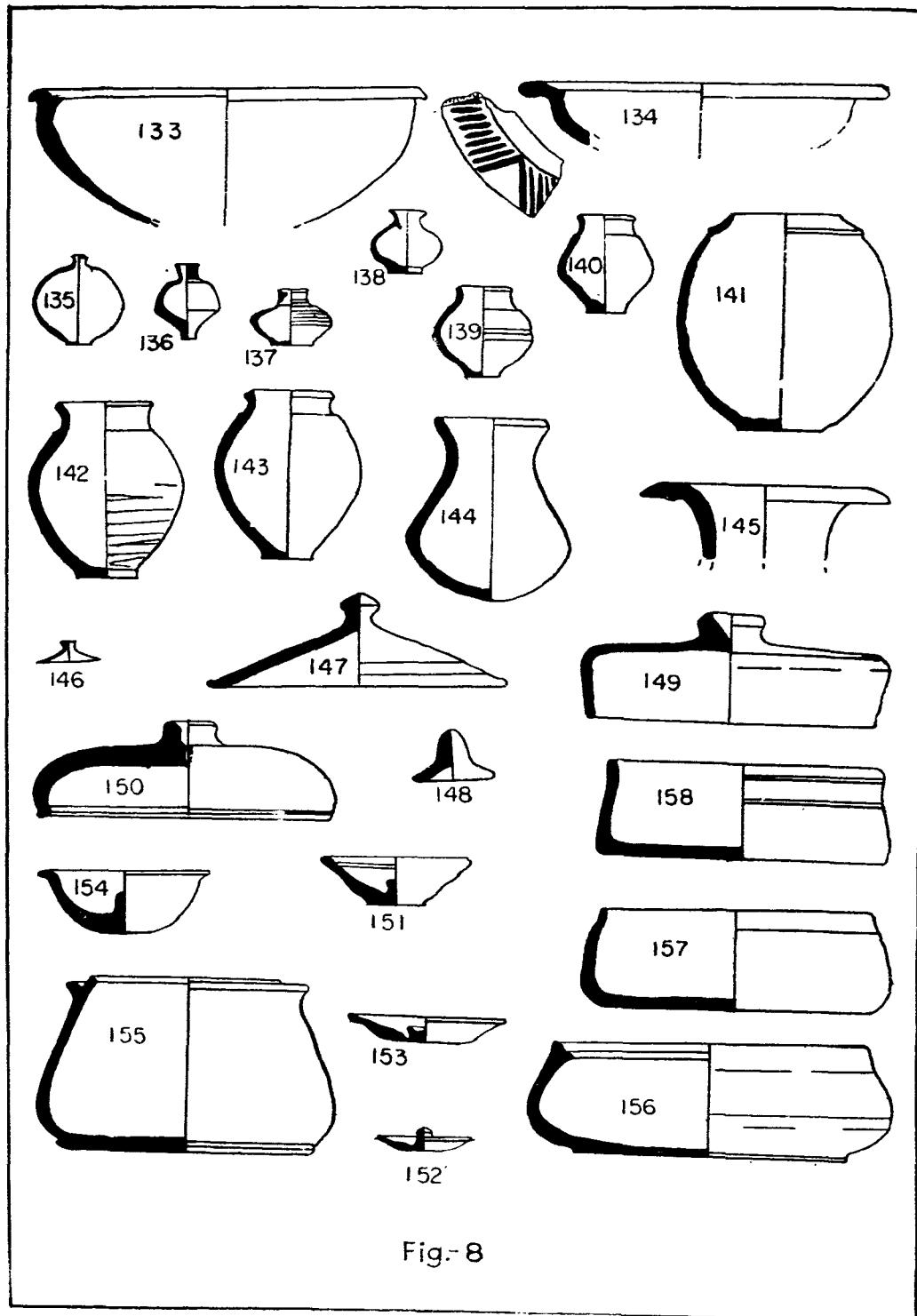


Fig.-8

[See Captions on pages 153 & 155]

in shape and size. They are made of medium to fine clay and generally treated with slip or wash. Some of the specimens bear painting these are met in red and buff wares.

VASES

135. It has a narrow mouth, short neck, globular profile and foot base. From Mohenjo-Daro.

136. It has a narrow mouth vertical neck, carination at the waist ending in a stemmed base. It is painted on the exterior. From Mohenjo-Daro.

137. It has a narrow mouth which has been further blocked by luting a tongue, wide shoulders, carination at the waist and foot base. From Mohenjo-Daro.

138. A variant of the above, differs in having bulging profile and ring base. From Chanhу-Daro.

139. It has an everted rim, ledge at the shoulder, groove and ridge at the waist, convex profile and foot base. From Mohenjo-Daro.

140. A variant of the above, differs in having an oblong form. From Mohenjo-Daro.

JARS

141. It has a closing rim, ledge at the shoulder, spherical body and foot base. From R-37 Harappa.

142. It has a flaring mouth, concave neck, ledge at the shoulder, convex profile and foot base. The lower half on the exterior is rusticated. From R-37 Harappa.

143. A variant of the above, differs in having externally thickened and obliquely cut rim. From Mohenjo-Daro.

144. It has an externally flanged rim, concave neck, oblong carinated profile and rounded base. From Lothal

145. It has a wide mouth, flaring rim and long neck. From Alamgirpur.

Lids : The lids are of common occurrence and are both hand-made and wheel-turned. Most of these are plain, but certain specimens bear linear paintings on the side exposed to view and also slipped.

146. It has a knob at the top and flaring sides. From Mohenjo-Daro.

147. A variant of the above, differs in being bigger in size. From R-37 Harappa.

148. A variant of 146 being smaller in size. From Chanhу-Daro.

149. It has a hollow central knob at the top and tapering sides. From R-37 Harappa.

150. A variant of the above, has rounded profile. From R-37 Harappa.

151. It is of a bowl type, has flaring sides, flat base with a solid central knob inside. From Chanhу-Daro.

152. A variant of the above, differs in being rather flat and the central knob is higher than the sides. From Chanhу-Daro.

153. A variant of the above has a depression on the knob. From Chanhу-Daro.

154. It has horizontally splayed rim, sub-spherical profile with a solid central knob inside. From Alamgirpur.

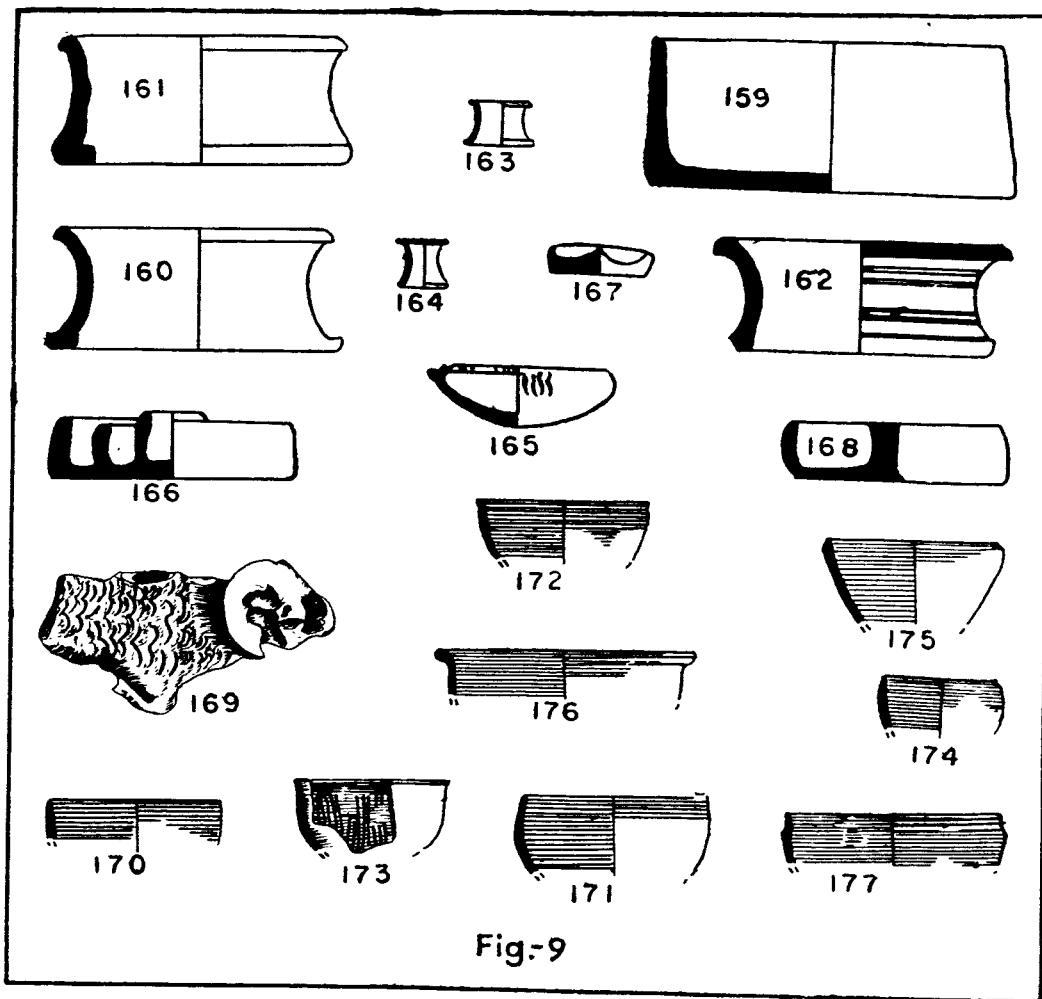


Fig.-9

[See Captions on p. 157]

Caskets: These are generally made of fine clay, slipped and painted. They are usually found with a lid. A ledge below the rim suggests that when in use a lid was put as a cover. It is any one's surmise that what was kept in such caskets. May be they were used in the kitchen to keep the food before it was served. A specimen from Chanhudaro bears perforations, which may suggest that the vessel was used for keeping vegetables or fruits and the perforations provided vent for fresh air. They occur at all the Harappan sites.

155. It has a closing otherwise wide mouth with a depression inside below the rim and ledge on the exterior to receive the lid, tapering sides, carination above the foot base. From R-37 Harappa.

156. A variant of the above differs in having a thickened rim with a depression inside to receive the lid. From R-37 Harappa.

157. It has short vertical featureless rim, ledge below, tapering sides and flat base. From R-37 Harappa.

158. A variant of the above has concavity below the rim. From R-37 Harappa.

Fig. 9

159. A variant of 157 has tapering sides and a featureless rim. From R-37 Harappa.

Ring-stand: The ring-stand has been recovered from almost all the Harappan sites. They are wheel-turned, sturdy built generally treated with wash or slip of cream or red colour and often bearing linear paintings. These were used for huge jars and other vessels which were kept on them to provide a firm footing.

160. It has an externally thickened rim, concave sides flaring base with up-turned edge. From Mohenjo-Daro

161. A variant of the above has inturned base. From Mohenjo-Daro.

162. A variant of 160 bears paintings on the exterior. From Alamgirpur.

163. A variant of the above being a miniature. From Mohenjo-Daro.

164. A variant of the above being taller than the girth. From Mohenjo-Daro.

Lamps: The lamps would have been of a very common occurrence. Rectangular types have been reported from Harappa. They have also been found from sites in Gujarat.

165. It has an incurved rim, with a lip and rounded base. The exterior is painted. From Lothal.

166. It has two concentric compartments with a crosswall. From Lothal.

Compartmented trays: The trays of this type are fewer in number and occur in the Indus region alone. They are hand-made and at times treated with a buff slip.

167. It is a rectangular shallow tray having two compartments and flat base. From Mohenjo-Daro.

168. It has incurved profile having two compartments and flat base. From Kot Diji.

Group C

ZOOMORPHIC VESSELS

The Zoomorphic pots were not popular with the Harappans. A single specimen of this class has been found at Mohenjo-Daro. Another doubtful fragmentary vessel is reported from Alamgirpur. Similar vessels have been recovered in the post-Harappan Chalcolithic cultures and continued in the early historical period. The evidence from Chandoli and Ujjain may be cited in this regard.

169. The piece from Mohenjo-Daro is in the form of a couchant rim. It is made of medium clay and treated with creamy slip. The body is covered with lunar marks to show the wool. The hind part is not treated well, but the head is beautifully modelled. The eyes are in applique, obtained by oval pallets. It is hollow and has a rimmed aperture on the back to use it as a vessel. It has been suggested that it was used as an ink-pot which is quite likely. But its size which is five to thirty-five inches in length

may indicate that perhaps it was not used as an ink-pot.

Group D

THE BLACK-AND-RED WARE

The history of black-and-red ware in India begins from Gujarat. It has been found at several sites in that region alone in association with other Harappan Pottery. The so far known sites being Lothal, Rangpur, Rojdi, Prabhas Pathan, Amra and Lakhabawal. At Lothal it presents a completely new picture. The excavations revealed that the site was already in occupation of a people who were using black-and-red ware and Micaceous Red Ware before the Harappans reached there. In the words of Rao "Different indigenous culture groups occupied the coastal belt of Gujarat before the advent of the Harappans. Micaceous Red Ware and black-and-red ware have been found in the lowest level.... It is true that a purely pre-Harappan level is not yet reached at Lothal but the Micaceous Red Ware and the black-and-red ware had lived for a considerable time as inferred from ten feet thick occupational debris below water table, wherein large quantities of Micaceous Red Ware and black-and-red ware and Harappan ware in sprinkling have been found. The Harappans after settling at Lothal absorbed the two ceramics *i.e.* Micaceous Red Ware and the black-and-red ware. The Harappans living in Sind, Panjab, North-Western Rajasthan and Western Uttar Pradesh did not know about the black-and-red ware.

Bowls of various types have been recovered from Lothal. Some of them are painted inside only with vertical or wavy strokes in white pigment.

170. It has internally thinned rim.
171. It has convex sides, was provided with a stud handle which has borken.
172. It has an everted rim with concavity below.
173. It has an everted rim, almost vertical sides and carination at the waist. It is painted inside with groups of vertical strokes.
174. It has internally sharpened rim and convex profile.
175. It has flaring sides and externally bevelled rim.
176. It has an externally clubbed rim and vertical sides.
177. It has vertical internally sharpened rim and a ledge below.

THE PAINTED DESIGNS

Figs. 10 and 11

The painted pottery at various Harappan sites bears a close semblance to each other, baring a few local variations and new subjects. The unmarked painted sherds from different Harappan sites if mixed together, it is not possible to sort them out. This remarkable similitude makes one think that perhaps these were made at one centre and diffused by commercial agencies. But keeping in view that the pottery is quite fragile and may not bear the hazards of long distance transport, though it is not impossible that some of the commodities may have been sent in pot-containers, yet as a general rule pottery may not have travelled long distances. However, it may be that there was a central school of potters and the artisans took training from the master potter and pot-painters. These trained potters established their industry and trade in different Harappan cities and towns

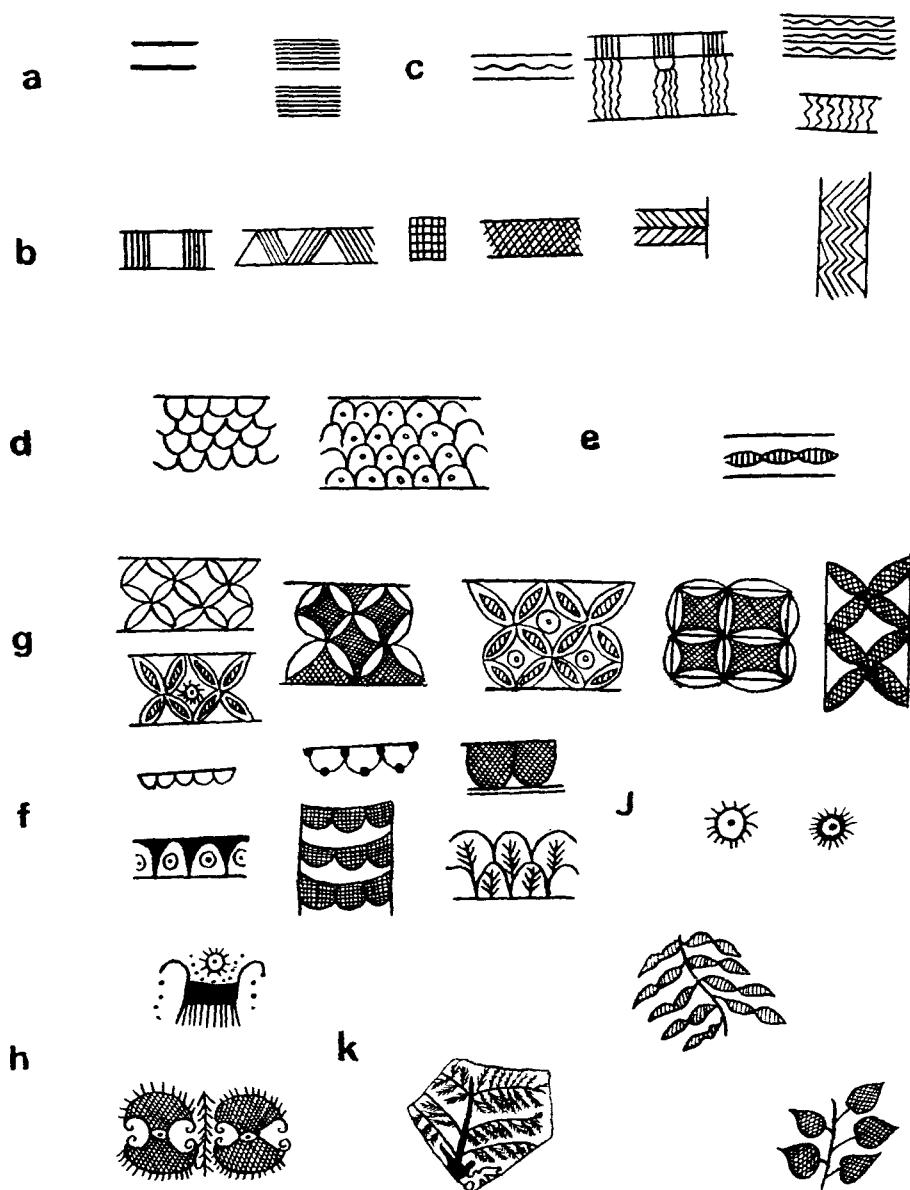


Fig.-10

or villages. As pointed out earlier the painted pottery may not be more than ten per cent of the whole pottery complex. The paintings can broadly be divided into two categories viz., geometrical and natural. These are founded singularly or in combinations.

(a) *Horizontal line band* : This is a very common and simple design, occurring in single or multiples, mostly used as borders.

(b) *Linear patterns* : These are combinations of horizontal and groups of vertical lines; horizontal and groups of oblique lines making blank triangles : combinations of horizontal and vertical lines making checker or criss-cross: bipinuet with horizontal and vertical lines, zig-zag and diamonds, these generally appear in registers.

(c) *Wavy line* : This appears in singular or in multiples and also in combinations ; both in vertical oblique and horizontal positions.

(d) *Fish scale* : This occurs in single row or multiples. Some times these are filled with dots or diamonds with dots or other motifs.

(e) *Chain pattern* : This is found in single or multiples rows and hatched or cross-hatched.

(f) *Loops* : These are akin to pillars with tendrils thus the blank space makes an arch. Some times the blank space is filled up by circlets or rosets. They also occur in 'U' shape and generally corss-hatched.

(g) *Intersecting circles* : This is a very characteristic of Harappan design. Various designs are made out by intersecting circles.

(h) *Comb motif* : Comb and double combs with teeth are not frequently met.

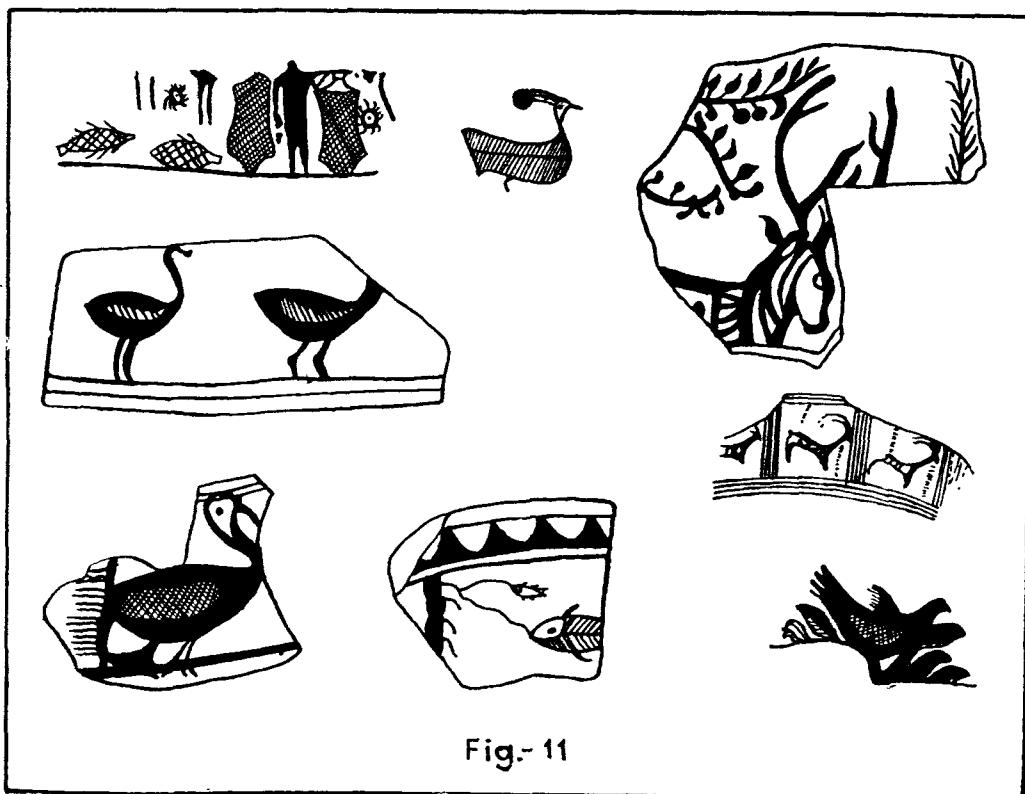


Fig.- 11

Natural Designs

(j) *Sun* : A simple circle or a few concentric circles with radiating strokes on the exterior represent the solar symbol. It occurs in combination.

(k) *Floral motifs* : Various plants and trees are painted. But the Harappan pot-painters had predilection for acacia and peepal leaf.

(l) *Faunal designs* : Human figures, bull, stag, ibex, peacock, duck, and dove ; fish were favoured to be painted.

Most of the motifs discussed above occur in the pre-Harappan and post-Harappan Pottery, but their lay out and composition differ.

1

2

3

The Problem of the Indus Script

12

ASKO PARPOLA

The Material : Its Provenance and Significance

AT THE time of writing, in 1975, the problem of the Indus script is exactly a hundred years old. It was namely in 1875 that Sir Alexander Cunningham published the first known specimen of the Indus script and raised questions about its nature. The seal, acquired at Harappa, a ruined site in Punjab, was of a previously unknown type, bearing on its face the image of a unicorn bull and six strange signs that looked like writing (*Cunningham, 1875*). By 1912, two further seals, also from Harappa, had become known (*Fleet, 1912*).

The unique character of the Harappan seals aroused the interest of Sir John Marshall and initiated systematic excavations at Harappa in 1921 (*Marshall, 1923*). In 1922 R. D. Banerji, while studying a Buddhist stupa at Mohenjo-Daro in Sind, happened to come across a number of seals of the Harappan type (*Marshall, 1931, I p. 10 f.*). Two years later, Sir John publicly announced the discovery of the Indus Civilization, printing in that connection many seals with writing as the most distinctive and interesting finds (*Marshall, 1924*). The official reports of the large scale excavations at Mohenjo-Daro (*Marshall, 1931; Mackay, 1938*) and Harappa (*Vats, 1940*) describe altogether almost 2500 seals (some without writing) and other kinds of inscriptions.

Later digs of Harappan sites, notably Chanhudaro in Sind (*Mackay, 1943*), Lothal in Gujarat (*Rao, 1956-57, 1962, 1973; IAR, 1954-55 ff.*) and Kalibangan in Rajasthan (*IAR, 1960-61 ff.*), have added the number of available inscriptions with about 250. Recent museum studies have brought to light over five hundred more texts, which had been forgotten unpublished from the early excavations of the 1920s and 1930s. (For details and references concerning the presently available material see at the moment *Koskenniemi, Parpola and Parpola, 1973, p. viii f. and xvi f.; Parpola, in press, g.*)

A little over thirty Indus seals have been reported to come from the Near East. One of them was found by Ernest Mackay at Kish just when Marshall made his announcement of the discovery of the Indus civilization (*Mackay, 1925*). Such stratified Indus seals found in the Near East have been instrumental in dating the Indus civilization between

the middle of the third and the beginning of the second millennium B.C. (*Gadd, 1932; Wheeler, 1968, pp. 114-120; Brunswig and Parpola, in press*).

With the ongoing further work, the number of the textual material in the Indus script keeps slowly rising. Its importance lies partly in the fact that writing forms one of those many criteria that authorise us to speak of the Harappans as the creators of one of the earliest civilizations of mankind :

"Everywhere in the Ancient World writing appears first at a time which is characterized by a simultaneous growth of all those various elements which together make for what we usually call civilization. Whenever writing appears it is accompanied by a remarkable development of government, arts, commerce, industry, metallurgy, extensive means of transportation, full agriculture and domestication of animals, in contrast to which all the previous periods, without writing, make the impression of a rather primitive make-up. There is no need, however, to urge that the introduction of writing was *the* factor which was responsible for the birth of original civilizations. It seems rather that all the factors—geographical, social, economic—leading towards a full civilization simultaneously created a complex of conditions which could not function properly without writing. Or, to put it in other words : **Writing exists only in a civilization and a civilization cannot exist without writing.**" (*Gelb, 1963, p. 221 f.*)

Beyond this, the significance and attraction of the Indus texts lies in their holding the answer to some of the most tantalizing questions asked by archaeologists, historians and students of the Indian culture ever since the discovery of those ancient metropoles : What language did the Indus people speak? What were their names? How did they call their deities?

II. Obstacles to, and Conditions for, a Successful Decipherment

Because of the great distance from Mesopotamia, and the largely indirect nature of the trade, the cuneiform documents have preserved to us only vague references to this country at the end of the known world. The most important piece of information is the name of Meluhha (or possibly Melahha by which the Sumerians knew the Indus civilization; but even this identification is questioned by some scholars. (For a select bibliography of the Sumerian-Harappan connections and the Meluhha references, see *Parpola & Parpola, 1975*, which examines the etymology of the name.) While the contemporary written sources thus tell us very little about the Indus people, we can except still less mention of them in the oldest historical records of India, the Rgvedic hymns, which were composed some time between 1400 and 1000 B.C. (cf. *Renou, 1957, p. 43 f.*), more than half a millennium after the end of the Indus civilization in the Indus valley (cf. *Dales, 1973*). It is true that the Rgveda makes reference to dark-hued Dasas or Dasyus as the foes of the invading Aryan tribes (*Kane, 1940, II : 1 p. 25 f.*), but these appear to have spoken an Aryan language, though a different dialect. The word *dasa* is of Aryan etymology, and has in some Iranian languages the positive sense of 'man' (in contrast to later Sanskrit 'slave', derived from the self-appellation of the Vedic war captives); tribes calling themselves Dasas, like the Iranian Dahas, had probably come to India before the Rgvedic

Aryans, and mixed there with the descendants of the Indus civilization (cf. *Bailey, 1959, Parpola, 1974*).

This lack of definite knowledge regarding the underlying language, and of historical data relating to the Indus civilization (names of Harappan kings and other persons, gods, cities, etc.), forms one of the greatest obstacles that has hampered the decipherment of the Indus script. Another grave difficulty has been the absence of texts which would be accompanied by translations of their contents into one or more readable scripts and languages. The Rosetta stone with a Greek translation of a text in both hieroglyphic and Demotic Egyptian provided the key to the Egyptian hieroglyphs, and the names of the Persian kings opened up the secret of the cuneiform script, while the likelihood that the Ugaritic script rendered a Semitic language made its quick decipherment possible. (*Friedrich, 1966; Dobelhofer, 1961; Gordon, 1971*). The Ugaritic script, moreover, has only thirty different signs, which could hardly represent anything else but single letters; this was another circumstance that greatly eased its interpretation (*Ibid.*) The Indus script, by contrast, consists of hundreds of different signs—about 200 simple signs and 200 combined signs (cf. the sign list in *Koskenniemi, Parpola and Parpola, 1973, p. xxii-xxvi*, with a few corrections in *Parpola, in press, c*)—and thus clearly belongs to a more primitive and more complex type of writing. In addition, the Indus texts are all very short: their average length is five signs, while the longest continuous specimen has no more than 17 signs, divided to three lines (*Koskenniemi, Parpola and Parpola, 1973, p. ix f.*) This greatly limits the possibilities of grammatical and semantic analyses. Even the word division has not been indicated in Indus texts, as it has in many other ancient writings.

Experts in the decipherment of ancient scripts, such as Friedrich (1966, p. 145), have considered these obstacles insuperable. It appears, however, that there is only one absolutely necessary condition for a successful decipherment of the Indus script, namely, that the language underlying it can at some stage be identified as belonging to a language group known to us from other sources sufficiently well. If no other trace of the Indus language and its relatives have survived but the Harappan texts, the situation is much worse than with the Etruscan language: because it is practically speaking without relatives, Etruscan largely remains a closed book, although it has been written in a readable alphabetic script, and numerous very long texts as well as translations are available. (*Dobelhofer, 1961, p. 299 f.; Barber, 1974, p. 3 f.*) In that case the Indus script can be interpreted only to the extent of unverifiable and more or less likely guesses about the meaning of individual signs, and even bilinguals yet to be discovered would permit an extremely limited phonetic decipherment and that only if they contain proper names.

III. General Notes on Methodology

One of the best known attempts to decipher the Indus script is that by Henry Heras, based on the assumption that the Harappan language belonged to the Dravidian group (*Heras, 1953*). It is easy to understand why it has not been accepted, if one reads some of his translations of the Indus seals:

“The mother of the middle of the year walking ant-like” (p. 97).

“The rain clouds which are in the flowery luxuriant trees (are) of Malayam (Malabar)” (p. 98).

"There is no *n:ndal* (feast) in the place outside the country of the Minas of the three fishes of the despised country of the Woodpecker" (p. 98).

Common sense says that whatever were the methods by which these translations were reached, they cannot be correct. These are not phrases that any sensible people would have written on their seals. In the Indus valley, as everywhere else, it was undoubtedly the practical, administrative and commercial needs that created the seals and their writing: in all analogy, they contained chiefly names of individuals (with or without further specifications, such as father's name), official or occupational titles, and names of institutions such as temples.

We must exercise similar judgement with regard to all other aspects of the problem. We want only a solution that in every respect is in agreement with the solid, generally accepted knowledge, particularly important being the history of writing, linguistics, history, archaeology and anthropology. The methods by which the solution has been achieved must be scientific, and the results consistent, meaningful, and controllable by objective means. Briefly, both the theory as a whole and each individual interpretation must smoothly fit the entire external and internal evidence, and fulfill all critical requirements that can reasonably be demanded.

It is not easy to achieve such a goal with so scanty materials. To be successful, work aiming at the decipherment of the Indus script requires patience and persistence. It also demands some flexibility, since it can only proceed gradually and by the way of trial and error. The problem of an undeciphered script can be compared with a crossword puzzle, where one has to start somewhere by making a guess. If no guesses are made, the puzzle can never be completed. The guesses may be wrong or correct, however likely they seem in the beginning. What is important is that one goes on making guesses that have some likelihood until one gets internal confirmation through the convergence of guesses that cross each other in the grid. Each further confirmation of this nature makes the solutions more and more reliable. *Errare humanum est* and as one is bound to make mistakes, it is necessary to preserve an open mind and not to cling to one's 'commitments', but to accept justified criticism and try a new with other possible solutions. Only by constant perfectioning of the construction, and by insisting on clues that seem to correct, can one reach a real breakthrough. (cf. Gordon 1971, p. 25.)

IV. Criticism of some approaches and proposed solutions

None of the solutions so far presented have been unanimously accepted. Yet most of them have made some positive contributions or judgements. Father Heras, for instance was in my opinion quite right on a number of rather important points, but he did not succeed because he was wrong on some others. Since the distribution varies in the many different solutions offered, many details of the eventually correct solution may have been individually anticipated. It is therefore certainly worth while to go through all the previous attempts, and to try and shift apart what is good and what is bad in them. Within the limits of this short paper it is, however, not possible to describe them even briefly, let alone subject them to a critical examination. I have to pass over a great number of attempts that are mainly of a historical interest and curiosities. As one example I mention the well known but definitely refuted comparison of the Indus script with the pictorial

representations on the wooden tablets of the Easter Island. There is no historical evidence to support the elaborate theories of a folk migration from India to the other side of the world, the very middle of the Pacific Ocean. The Easter Island tablets are many thousand years younger than the Indus inscriptions, and they would make a singular case in preserving the shapes of a script faithfully through the vicissitudes of so many millennia and migrations. In fact, however, the Easter Island tablets represent no real writing at all, and the resemblances to the Indus characters are rather superficial. In addition, the whole theory would help us nowhere in the interpretation of the Indus script, because the meaning of the Easter Island tablets itself is a problem. (The proposal was made by Hevesy, 1933, 1934; supported by Heine-Geldern, 1950; refuted by Otto 1936, pp. 112-4; Metraux 1938; and others.)

Numerous scholars and amateurs, particularly from India, have proposed various Sanskrit solutions to the problem of the Indus script. Methodologically they are, as a rule, open to very serious criticism, particularly in regard to the history of writing and logic. Apart from that, they have to be denied because the devisers of the Indus script cannot have been Sanskrit-speaking Aryans. The Vedic texts and the comparative Indo-European linguistics prove for certain that the horse has always played a predominant part in the Aryan culture, and one would have expected the horse to occupy a central place in the religious iconography and osteological remains of the Indus civilization had its carriers been Aryans; in actual fact, however, the horse is conspicuously absent in the Harappan art tradition, and although its bones seem to be attested, they are so rare that domestication may be excluded (Marshall, 1931, I, p. 28; II, p. 653 f.; Allchin & Allchin, 1968, p. 260). The earliest archaeological traces of a possibly Aryan infiltration to the Greater Indus valley seem to be the chalcolithic cultures dating from about 2000 B.C. onwards (cf. Allchin & Allchin, 1968, p. 144 ff.; Agrawal & Kusumgar, 1974 p. 103 ff.). The Indus script, on the other hand, was created around 2500 B.C. by people who had come to the Indus valley still earlier, in the late fourth millennium B.C. (cf. Dales, 1973); and a study of the sign sequences of the Indus inscriptions shows that they remain stable throughout the Harappan period, which proves that there was no language shift until the second millennium B.C.

It is clear that the populous Harappan inhabitants with some 260 discovered settlements (Pande & Remachandran, 1971, pp. 37-43) were not exterminated when the Indus civilization came to its end. In Gujarat we have clear archaeological evidence demonstrating their gradual assimilation into the subsequent chalcolithic cultures (Allchin & Allchin, 1968, p. 179 ff.); the racial evidence indeed suggests that the Harappans are the chief element in the making of the present-day North Indian population (Cappieri, 1965). The graffiti of the chalcolithic and the subsequent megalithic pottery of the Deccan that have been compared with the Indus script (Lal, 1960), and possibly also the symbols of the punch-marked coins of the North-West from the last centuries B.C. (Fabri, 1935; cf. however, also Dani, 1963, p. 21), may provide additional evidence to this as faint reminiscences. For the actual reading of the Indus script, however, they contribute little, since they do not represent any real writing and themselves pose a problem of interpretation.

When Cunningham considered the first solitary Indus seal in 1875, he thought it to be a foreign import, because its writing did not resemble any previously known Indian script, and because the accompanying bull did not have the characteristic hump of Indian cattle. A few years later, however, he supposed that the seal might bear "archaic Indian

letters of as early an age as Buddha himself", and read them tentatively *l-u-chh-m-i-ya* (*Cunningham, 1879, p. 61 f.*). We now know that this inscription is to be read from right to left (in the impression), not from left to right as Cunningham did. Besides, the first and last sign have been partly worn out : their full forms differ much from the Brahmi characters compared by Cunningham. Many scholars have afterwards insisted that the Brahmi script is derived from the Indus script. One of the arguments has been the alleged similarity or identity of several signs. A close examination, however, shows that most of these comparisons have no base at all. Thus the Indus inscription reproduced by S. Langdon as (*in Marshall, 1931, II p. 426*).

immediately reminds one of the Brahmi characters

and

ma. Checking of the original sealing (*Ashmolean Museum, Oxford. Dept. of Antiquities, 1931 : p. 120*) proves, however, that the published copy is quite wrong : none of the signs

exist. Altogether, the similarity is restricted to a few very simple linear signs. Another characteristic of the Indus script, which has led students to link it with the Brahmi and other later Indian scripts, is the fact that certain signs have diacritic addition (cf. e.g.);

this has been compared to the later practice of marking different vowels (*Hunter, 1932, 1934*). In spite of the possible faint reminiscences mentioned above (the graffiti and punch-marked coins), it seems certain that the art of writing ceased with the Indus civilization, having lost its *raison d'être*, the complex urban way of life. Moreover, Brahmi has convincingly been shown to be derived from the Semitic writing, though it has not yet been definitely established when exactly between the 9th and 3rd centuries B.C. this took place (*Buhler, 1896, p. 10 ff.; Dani, 1963, p. 23 ff.*). The Semitic script expressed consonants only, partly because it was derived from the earlier and more complicated Egyptian writing having this same characteristic, and partly because the structure of the Semitic languages made it possible to manage somehow with such a script. Occasionally, however, even the vowels were marked in the Semitic script, and it was the systematization of this practice by the Greeks, when they adopted the Phoenician script, that meant the creation of the modern alphabet. The addition of diacritic marks for the expression

of vowels in India was a parallel improvement (cf. *Gelb*, 1963, p. 147 ff., 197 f.). The Brahmi script thus represents a highly developed form of writing, practically speaking the alphabetic stage. The history of writing shows that even the previous stage represented by the syllabic script is the result of a long development, which was reached in the Near East (where writing had been known since the late fourth millennium B.C.) only around 2000 B.C. "In reaching its ultimate development writing, whatever its forerunners may be, must pass through the stages of logography, syllabography, and alphabetography in this, and no other, order. Therefore, no writing can start with a syllabic or alphabetic stage unless it is borrowed, directly or indirectly, from a system which has gone through all the previous stages" (*Gelb*, 1963, p. 201). Since the Indus script was created around the middle of the third millennium B.C. when no syllabic, let alone alphabetic writing system existed, it cannot possibly represent such an advanced stage as the Brahmi script. This is definitely proved also by the number of different signs: an alphabetic script has about 15-40 different signs; purely syllabic systems specifying the vowels about 40-150; and word-syllabic systems up to about 700 signs (cf. *Burber*, 1974, p. 93 f.). In the limited material presently available, the Indus script has about 400 different signs.

Immediately after the discovery of the Indus civilization became known in 1924, several assyriologists pointed to its resemblance to the Elamite and Mesopotamian civilizations (*Sayce*, 1924; *Gadd & Smith*, 1924). They also compared the Indus pictograms with those of the Proto-Elamite and archaic Sumerian scripts, and suggested that the Indus civilization might be genetically related to the Meopotamian. Hardly one year later, L.A. Waddell published a book entitled *The Indo-Sumerian seals deciphered* (1925), in which he 'read' all the published seals. Waddell's methodology consisted briefly of the following steps :

- (1) choosing a Sumerian sign which resembles a given Indus character,
- (2) reading the inscription with the respective values of these Sumerian signs, and
- (3) identifying the thus read names as revised forms of the names of Sumerian kings "as 'restored' in great part fictitiously by Assyrologists" (p. 32), and
- (4) further to the names of Aryan kings in the Veda and the Epics.

The last step came to 'reveal' new 'historical data' with which Waddell rather radically revised the entire early history of mankind, as is indicated by the subtitle of his book : 'Discovering Sumerians of the Indus Valley as Phoenicians, Barats, Goths & Famous Vedic Aryans 3100-2300 B.C.' Such 'nonsensical writing, which can be nothing but a hindrance in the way of useful research'—to use the words of Marshall (1931, I, p. ix), which undoubtedly in the first place refer to Waddell (cf. also the review of *Charpentier*, 1925)—would not have deserved a lengthy mention in this short paper, had not J.V. Kinnier Wilson revived the topic with his recent book *Indo-Sumerian* (1974). Kinnier Wilson supposes that 'the two scripts branched out from a single stem at some early period and that original features are preserved in both' (p. 43). He, too, compares Indus signs with Sumerian signs and adopts their phonetic and semantic values for the interpretation of the former. The numeral signs of the Indus script, as studied in 1938 by Alan S.C. Ross, play a central role in Kinnier Wilson's approach to the problem. Comparing Indus texts which have numbers with Sumerian economic texts, he is primarily concerned with interpreting certain Indus signs as units of measure, bigger

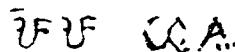
numbers, and names of various commodities. This procedure is in my view open to the objection that the Indus texts are seals, and as such not comparable to economic transactions recording quantities of traded goods. The numbers can be interpreted differently.

When Waddell published his book, the "Indo-Sumerian" hypothesis was in the air. Although Indus seals discovered in Mesopotamia in third millennium B.C. levels definitely establish a trading contact, already Marshall (1931, I p. 109 f.) could point to a number of essential differences between the two civilizations, and to the insufficiency of the arguments produced to substantiate the hypothesis of a common descent. Recent archaeological researches have proved that Marshall was right. It appears certain that the Indus civilization has grown out of the so-called Early Indus cultures (ca. 3000-2500 B.C.) of the Greater Indus valley (including Rajasthan, Baluchistan and Afghanistan), which in their turn are derived from the earlier culture of Southern Turkmenia: it was only about 3000 B.C., when both the Mesopotamian-Elamite and the Turkmeno-Indus cultural spheres had attained their individuality, that their interaction started (Dales, 1973). It is then, clear, that the Indus people were not Sumerian colonists.

That the Indus people and Sumerians in all likelihood spoke quite different languages seems to be confirmed by the analysis of the Indus inscriptions engraved on the seals found in the Near East and in the Indus valley. Most of the Indus seals recovered from Mesopotamia have features differentiating them from the native Indus specimens, particularly their form, which is either cylindrical in the characteristically Mesopotamian fashion, or round like the seals of the Persian Gulf traders (Gadd, 1932; Bibby, 1958, 1969); recently several Indus seals have been found in the islands of the Persian Gulf, too (Brunswig & Parpola, *in press*). Textual evidence in the cuneiform documents suggests that some Indus people residing as trade agents in the Near East for centuries, adopted local customs and even the local language and proper names (Parpola, Parpola & Brunswig, *forthcoming*). Although the pictograms on the round and cylindrical seals are genuine Indus signs, their sequences are mostly quite unique, differing radically from the native Harappan square seals including those few square seals that have been found in the Near East. For example the most frequent sign of the Indus inscriptions.



never occurs side by side with itself in the Harappan sites. On a seal coming from Mesopotamia (Gadd, 1932, p. 202 pl. III; 17), however, we read :



all the pairwise combinations in this inscription are unique, although each sign individually is very common (Koskenniemi, Parpola & Parpola, 1973). It seems, therefore, that the Indus script was in the Near East used to write foreign (Near Eastern) proper names adopted by acculturated trade agents, who nevertheless had to communicate with the Harappans and therefore to use the Indus script (cf. Hunter, 1932, p. 469; Parpola, Parpola & Brunswig, *forthcoming*). Parallel uses of one or several scripts for conveying

SCRIPT	SIGN	MEANING	PHONETIC VALUE	REFERENCE
Archaic Sumerian		mountain (s) hill-country (as distinct from the plains where the Sumerians lived), foreign country	kur	Falkenstein, 1936, no. 189; Labat, 1959, no. 366
Hieroglyphic Egyptian		sandy hill-country, foreign land	h3st (h3st)	Karlgren, 1957, no. N 25
Archaic Chinese		mountain	dw	ibid. no. N 26
Hieroglyphic Hittite		mountain hill hill, mound, big mound, earthen hill	* san / san / shan * k'iuq / k'ieu / k'iu * b'ioq / b'iou / sou	Karlgren, 1957, no. 193 ibid. no. 994 ibid. no. 1108
		mountain	harnas	Meriggi, 1937, no. 196

different languages can be cited from other ancient cosmopolitan centres (cf. *Gordon*, 1971, p. 33).

The Sumerian and Harappan scripts are pictographic, that is, most of their signs are more or less schematized pictures of concrete objects. If different peoples design a pictographic writing system, the resulting scripts are very likely to contain some similar signs, even if there had been no contact whatsoever between those peoples. The range of concrete objects that can be recognizably depicted is fairly limited, and it may be quite natural that a picture of a certain object is drawn similarly everywhere: there is not too much choice in representing pictorially a 'man', a 'mountain', an 'arrow', etc. (cf. *Gelb*, 1963, p. 218). Hence the following comparison of signs depicting "mountain(s)" in various pictographic scripts (fig. 1) does not prove that any of these scripts has borrowed its sign from one of the others :

It is, however, important that these signs have different phonetic values in the various scripts, since the words denoting these concepts in the respective languages are different. In the Indus script we have a sign



(with



as a variant), which can be compared to the above signs, but it does not seem methodically justified to transfer the phonetic value of any of them. In my opinion the Indus script does not have a sufficient number of distinctive (complex) signs in common with any other known script to warrant a conclusion of borrowing or common descent.

In the early 1950's Michael Ventris succeeded in breaking the secret of the Linear B script without any translations and without knowing in advance its language, which to his surprise turned out to be archaic Greek. The key was provided, above all, by a meticulous internal analysis of the texts, in which also other scholars made every important contributions. It is impossible to describe in a sentence or two adequately what was involved; I strongly recommend that those who are interested in the subject read John Chadwick's excellent book *The Decipherment of Linear B*. The purpose of the textual analysis was, as Chadwick (1960, p. 41) puts it, "to determine the meaning of sign-groups without knowing how to pronounce the signs". It was, for instance, possible to conclude with a fair probability that certain words in the texts were place names (*ibid.*, p. 62). Also, the reasonable working hypothesis (which then turned out to be correct) that the script was of the syllabic type and consisted mainly of signs having the structure consonant - vowel enabled Ventris to build up a chart indicating the relationships between the various elements in the phonetic values of the pictograms, although he did not know what those values actually were. This process may be illustrated by comparing the Latin inflection *do-mi-nu(s)* : *do-mi-ni* : *do-mi-no* to such recurring sign groups in the Linear B texts which share two or three identical signs but differ in the final sign. It could be assumed that those different final signs all had the same consonant but a different vowel. When the chart of relationships was ready, the actual phonetic values were established by applying the later historical names of the find sites to the words hypothetically identi-

fied as place names in the local Linear B texts. The point is that by means of the grid it was possible to extend the correctly identified phonetic values of just a few signs to the corresponding elements of a large number of signs in the grid, and when the so reached phonetic values were transferred to the signs as they occur in the texts, these started speaking (cf. *Chadwick, 1960, pp. 54-66*).

Similar methods have proved successful in the decipherment of other ancient and modern scripts, too. Initial steps in their application to the Indus script were taken already in the late 1920s. G. R. Hunter (1934) copied all inscriptions known by then—about 800 in all—and prepared a sign list that recorded the various contexts in which each sign occurs. He also made a comparison of the Indus signs and those of other pictographic scripts, and commented these analyses. Other useful ‘sign-manuals’ by Gadd and Smith (1931) and Vats (1940) were attached to the Mohenjo-Daro and Harappa excavation reports. Hunter, Gadd and Smith made several observations that proved beyond doubt that the direction of writing in the Indus script is usually from right to left. This was later confirmed by Lal (1966, 1967-68), who reported partially overlapping pictograms on pottery sherds found at Kalibangan. In 1934, P. Meriggi tried to deduce the intended meaning of some texts without actually reading them phonetically. By a structural-comparative analysis of the texts he endeavoured to define their general purport and sentence-patterns, and deduced the meaning of the words in these sentences from the pictorial form of the signs: e.g., the picture of a man with a carrying yoke he interpreted to mean ‘load’. This study has several merits, but its results have been considered by many to be purely conjectural.

In 1964 the writer and his friends formed a research team which, inspired by Chadwick’s above mentioned book, took up the study of the Indus script. One of us is a computer mathematician, and the compilation of the necessary statistical and positional analyses with the help of the computer was our immediate aim (*Parpala, Parpola & Koskenniemi 1966*). The epigraphical-analytical work started over ten years ago is still going on. It has involved such things as collecting the texts from the various publications and other sources; establishing a classified sign list where mere variants (allographs) are distinguished from independent signs; ascertaining of the correct reading of each inscription; transcribing the texts (with reference numbers and codes indicating the inscriptional category, the accompanying iconographical motif, and the number of lines or inscribed sides) into numerical form; and programming the computer and instructing it to draw the results in Indus characters. In 1973 we published, as the first volume of *Materials for the study of the Indus script*, a concordance to the pairwise sign combinations occurring in the Indus inscriptions. The forthcoming volumes will contain a critical edition of the texts, with all sorts of indices, tables of the signs with all the graphic variants, statistics about their occurrence in various positions within the inscriptions etc. (*Parpola, 1971; Koskenniemi, Parpala & Parpola, 1973*). Visits to Pakistani and Indian museum to check readings that can only doubtfully be seen in the published photographs turned out to be more fruitful than expected, for they brought to light inscriptions about the existence of which no one seemed to be aware. This was simultaneously and independently found out also by I. Mahadevan, who has been working on the Indus script since 1969, and has undertaken to compile his own concordances to the Indus texts by computer; when published, they will provide a useful check and contribute substantially to the critical study of the Indus script (*Mahadevan & Visvanathan 1973; Mahadevan, 1973*). The

numerous unpublished seals and the not always satisfactory quality of the previous publications make a new photographic edition of all the Indus seals and inscriptions desirable; it is being prepared, under the auspices of the UNESCO, by the writer in collaboration with M. Rafique Mughal, Department of Archaeology and Museums, Government of Pakistan, and B. K. Thapar, Archaeological Survey of India.

Apart from compiling research tools, our team made experiments in automated decipherment methods (*Koskenniemi, Parpola & Parpola*, 1970). In the textual analysis our chief goals have been to establish valid criteria for the division of the inscriptions into separate words; to identify signs with a grammatical function; to map syntactic patterns; and to find words appropriate to different positions within the inscriptions and to different inscriptional categories. An important breakthrough seemed to be at hand in 1969, and three successive preliminary reports were released by our team (*Parpola, Koskenniemi, Parpola & Aalto*, 1969 a-c). They prompted both positive reactions (e.g., *Clau-son & Chadwick*, 1969) and severe criticism that was in part also justified (e.g., *Burrow*, 1969; *Zide & Zvelebil*, 1970). Mistakes need not be taken as eternal commitments but can be corrected, as in solving a crossword puzzle, and while developing our theory further during the past years, I have tried to take into regard all constructive criticism. Those initial reports have since been improved upon, not only by abandoning obvious errors and uncertain guesses. Some of their central ideas and interpretations have been developed considerably further. For the present state of research in this regard, however, I have to refer the reader to three papers now in press (*Parpola*, in press, c, d, g). It is possible only to sketch some outlines here.

Big problems are often more easily solved if they are divided into several smaller problems. In the case of the Indus script, we are facing three basic problems: (1) What is the type of writing represented by the Indus script? (2) What is the language rendered by the Indus script? (3) Can any specific Indus signs be convincingly interpreted?

To the first of these questions it is possible to give a relatively certain answer. In the third millennium, and more particularly around 2500 B.C. when the Indus script was created, there existed only three other writing systems proper, namely the Sumerian, the Proto-Elamite, and the Egyptian. The Proto-Elamite is still little understood, but very similar to the Sumerian. The Sumerian and the Egyptian scripts are quite clearly of the logo-syllabic type, and it seems hardly possible that the Indus script could be of the more advanced syllabic type, which, as mentioned above, developed only towards the end of the third millennium in the Near East (cf. *Gelb*, 1963, p. 195). I have already mentioned another indication pointing to the same result, namely the number of different signs. The term 'logo-syllabic' or 'word-syllabic' writing is defined as one "which uses logographic and syllabic signs" (*Gelb*, 1963, p. 250): a logogram expresses the word meant by a particular pictogram, e.g. the sign depicting an arrow means "arrow", and a syllabogram renders a syllabic sound irrespective of its meaning. While this traditional distinction is useful with regard to the Near Eastern texts of the late third millennium B.C., it does not seem to be valid for the earlier half of the third millennium. The earliest type of script should rather be called 'morphemicographic' (a term coined by Simo Parpola), because one and the same sign could be used in either semantic or phonetic function, having inherently both of the logographic and the syllabic value, e.g., in Sumerian the sign depicting an arrow = *ti* 'arrow' and *ti* (1) 'life', etc. (cf. *Falkenstein*, 1936, p. 33, 38). Such a use of pictograms to express not only the concrete object represented by the drawing but also

any other words or morphemes that sound similar to the name of that object (homonyms) is called the rebus principle, and it forms an integral and essential part of all archaic writing systems, being necessary for the expression of abstract concepts and for the economy of writing (cf. *Gelb*, 1963, p. 66 f., 193 f.; *Parpola*, in press, g). It seems that the Indus people learnt this principle of morphemographic writing from the Proto-Elamites (cf. *Gelb*, 1963, p. 219) at Tepe Yahya in southeastern Iran, where evidence has recently been found of both Proto-Elamite writing and of trade with the Early Indus cultures in the early third millennium B.C. (cf. *Lamberg-Karlovsky*, 1971, 1972a-b; *ibid.* & *Tosi*, 1973). The actual pictograms, however, the early Harappans in all likelihood devised themselves, probably making use of the Early Indus pot marks (*Fairservis*, 1956, p. 328 f.; *Lal*, in press; *Mughal* 1974, p. 110 fig. A) and art conventions (*Parpola*, in press, d.)

Clues for the identity of the Harappan language were sought in an unprejudiced grammatical analysis of the Indus texts. The evidence for grammatical structure that we have found points to an agglutinative language, in which the words are inflected by adding suffixes at the end, while prefixes are absent, and the attribute precedes the head noun. These features are best matched by the Dravidian group of languages, spoken in Pakistan, Afghanistan and India, if the search for suitable candidates is not extended over unreasonably long distances outside the subcontinent.

The Indus script, of course, does not provide the only possible clue to the identity of the Harappan language. When Marshall in 1924 announced the discovery of the Indus civilization, he already cautiously suggested that the Harappan language may have belonged to the Dravidian group. He pointed to the fact that archaeological objects analogous to those from Mohenjo-Daro and Harappa have been found in Baluchistan, and that the presence of the Dravidian language Brahui in Baluchistan gives reasons for believing that the Dravidian languages entered India by that way (*Marshall*, 1924, p. 548). Meriggi considered Brahui as the only reasonable possibility; in his opinion, however, it would be impossible to make use of the relationship even if it was a true one, because Brahui has changed so much during the intervening four thousand years, having been exposed to the strong influence of the neighbouring languages of quite different linguistic families. It was for this reason that he attempted a semantic decipherment only (cf. *Meriggi*, 1934, p. 198 f.). There are, however, over twenty other Dravidian languages besides Brahui which moreover have diverged quite early, and a reconstruction of the Proto-Dravidian mother language is therefore to a large extent possible, especially as Tamil, protected against foreign influence by other Dravidian languages, has been well preserved and possesses a rich literary tradition which is over 2000 years old. Father Heras, indeed, attempted reconstruction of Proto-Dravidian (cf. *Heras*, 1953, p. 68), which must be recognized though he was not quite successful in putting this theory into practice. On the other hand, it must also be pointed out that works that enable effective comparative Dravidian studies, above all an etymological dictionary (*Burrow & Emeneau*, 1961, 1968, 1972), have been published only during the last fifteen years, which have witnessed a quickly growing scientific interest in the long neglected Dravidian studies.

The Dravidian solution is undoubtedly the most likely one suggested by historical linguistics, although eminent linguists do not want to exclude other possibilities, including a total disappearance of the Harappan language (*Emeneau*, 1954, p. 282-4; *Burrow*, 1969, p. 149 f. in the 1970 repr.). It is now widely accepted that already the Rgvedic hymns

contain loanwords and even phonological and syntactic features which are borrowed from a Dravidian language spoken in the Punjab and the Madhyadesa in the second millennium B.C.: these Dravidian speakers have gradually started speaking Indo-Aryan and abandoned their original language, but in the process their mother tongue affected the way in which they spoke the new language. (cf especially *Kriper*, 1967, with further references).

The integration of the archaeological and linguistic evidence forms an important but so far little exploited source for the reconstruction of the Indian protohistory. I have tried to demonstrate that the long held views of an one-to-one connection between the advent of the megalithic culture and the advent of the Dravidian speakers to South India are untenable (*Parpola*, 1973 cf. now also *Leshnik*, 1974), and that a systematic integration of the whole subcontinental evidence gives further support to the Dravidian identity of the Indus language (*Parpola* 1974). The place names of the Harappan area make still one potential source to check the correctness of this hypothesis. They, too, give positive support to the Dravidian theory (*Parpola*, *in press. b. e*; *Parpola & Parpola*, 1975). The same is true of Dravidian etymologies for loanwords and translation loans in Sanskrit denoting some important religious and cultural concepts of historical India which can be shown to be of non-Aryan and also particularly Harappan origin (for an example, cf. below the discussion of the Vedic astronomy) (cf. also *Parpola*, 1973a).

The third problem of concrete interpretations is, of course, the most difficult one, but not impossible if the other two are correctly solved. In addition, two further requirements are essential for a successful decipherment of a given sign. First and foremost, one must be able to determine its intended meaning from its various contextual uses, from the nature of the objects in which the texts occur, and so on. In our case, we took as the starting point the most common category of the Indus texts, the seal inscriptions. We divided them on structural grounds into different phrase-patterns, and compared these phrase-patterns with their internal statistical ratio to the phrase-patterns of seal inscriptions in readable scripts, notably the seal texts of the third millennium Mesopotamia (*Edzard*, 1968) and historical India (*Thaplyal*, 1972). In the light of these parallels, the two main groups, ending in the signs



and respectively, seemed to



represent owner seals (with proper names or titles) and dedications [“(± given or dedicated) to . . .”]. On the strength of this hypothesis, the above mentioned two signs could represent either a nominative or genitive suffix, and a dative suffix, or else corresponding nouns e.g., ‘(X’s) possession’ and ‘gift (to X)’, or something similar. This working hypothesis gives a tentative basis for further deductions, notably for considering the signs immediately preceding the sign



as the names of the gods to whom something was given or dedicated. Signs occurring in

this position immediately before,



are also attested in words ending in,



but in that case they are normally followed by one sign intervening the hypothetical god's name and the ending: in such cases, theophorical propernames (i.e., including god's names as their element, such as Sanskrit *Kali-dasa* "the slave of goddess Kali) might be involved.

A second requirement is that the sign whose meaning has been deduced by such logical means can also pictorially be recognized. This is often very difficult, because the Indus script is much more schematic than e.g., the hieroglyphic Egyptian. Clues must be sought in the graphic variants of the sign itself, in the iconography of the seals, pottery motifs and other remains of the Indus and Early Indus cultures, pictograms of other ancient scripts (cf. the discussion of fig. 1 above, p.), etc. If the intended meaning is a concrete concept, it may have been drawn directly, in which case the agreement between the two gives more likelihood to the hypothesis of the intended meaning. For example, the above mentioned hypothetical god's names (above all the signs having the shape of fish) sometimes immediately precede also the sign,



without the intervening sign that is normally present in the hypothetical proper names. In such cases, however, the sign is almost invariably followed by one or two signs, whereas normally the sign



ends inscription. If the sign



denotes possession (either genitive or the word "own") or a nominative ending which can function as a zero genitive (as in Dravidian languages), the extra sign(s) following this and god's name could denote 'priest', 'temple', or the like. One of these signs is



apparently depicting 'man', which strengthens the hypothesis of the meaning 'priest'; a further support to it is the fact that in Dravidian the word *al* 'man' also means 'servant' (*Burrow & Emeneau, 1961, no. 342a*). If, on the other hand, the intended meaning has been rendered through a phonetic transfer by means of the rebus principle, we have to look for a language in which two separate words, one having the intended meaning, and another having the pictorial meaning are, pronounced alike. Since not all languages have suitable word pairs, such an agreement is very important for the language

hypothesis. When publishing our preliminary reports we had concluded from its use, which is somewhat parallel to that of the sing



probably meaning 'man', that the sign



might denote "woman", or female suffix, and discovered that in Dravidian the word *pen* (*i*) 'woman female' is pronounced similarly to another Dravidian word meaning 'comb', which may be reconstructed, though not wholly certainly, as *pen t ika* (cf. Burrow & Emeneau, 1961, 1968, nos. 3608a and 3607 respectively).

Only after the publication of our first preliminary report in 1969 we came to know the methods and results of a team of Soviet scholars who happened to start working on the Indus script simultaneously with us in 1964 (*Proto-Indica*: 1968, 1968). Headed by Yurij V. Knorozov, well known for his earlier computer work on the Mayan script, they, too have made use of the computer. Even otherwise our independent researches are in concord in several important respects. Soviet scholars have come to the same conclusion about the type of the Indus script, including the use of the rebus principle, attempted a division of the inscriptions into words, tried to identify grammatical elements, and to interpret individual signs from their contexts. Moreover, we agree also in considering the Indus language to be of Dravidian affinity. Although there is much disagreement between us at the moment in the interpretation of individual signs, even here some shared views can be found. Above all, both of our teams read the sign



as *min* 'fish' = *min* 'star' (these words have been homonyms already in Proto-Dravidian, cf. Burrow & Emeneau, 1961, 1968, nos. 3999 and 3954), and compare the combination



with the Old Tamil name of the Pleiades, *aru-min* 'six-star'. Both suggestions, it may be remarked, were besides made already by Father Heras (1953, p. 84, 100, 127). (cf. Sevoroskin, 1973.)

We have come to the final question: Even if interpretations and hypotheses reached by such methods may be possible and even plausible, can they be objectively proved to be right? As far as I can see, two sorts of proofs are possible. One group consists of internal proofs which can be compared to the verifications of the crossword puzzle: in the puzzle, words which at first are only likely guesses (they must, of course, match the given description and be of suitable length) validate each other when they cross each other in the grid. Similar convergencies can take place in the decipherment of the Indus script, when separately interpreted signs come together to form a meaningful new, third entity, either when forming a ligature (a composite sign formed by combining two or three different signs into one) or when forming a fixed combination, a compound word. An example of the latter is the above cited *aru-min* 'six-star'. It may be argued that

this can be accidental, but a large number of similar cases is rather compelling, particularly if they are systematic as our interpretation of the fish signs with diacritic additions (cf. above, p. 000) as ancient Dravidian names of the planets, in each case consisting of a colour word- *min* 'star'. By now there are many more similar convergences, but they cannot be cited here; the reader is referred to other papers (*Parpola, in press, d. g.*).

The other kind of proofs consists of agreements with the historical context of the Indus civilization. I have already explained how the Dravidian solution fits best the external evidence which is independent of the Indus script. The above mentioned interpretations of the fish signs agree with the factual information from later times. The names of planets and constellations read in the Indus texts are actually attested in historical documents and are of genuine Dravidian etymology. The fish signs which we read as planetary names make the most important group of those signs that we concluded from the contextual evidence to be probably god's name (cf. above, p. 000) The worship of such astral deities seems to have survived in the navagraha worship of later Hinduism; in the Harappan religion the five planets proper seem to have represented gods who in later times emerged as leading Hindu deities: Brahma, Rudra, Skanda, Kala (Yama), Krsna and Balarama (see *Parpola, in press, c,d.*).

Like Father Heras (1953) and our Soviet colleagues (*Proto-Indica*: 1968, *Proto-Indica*: 1972) in their own ways, I have also followed up clues which the fish signs of the Indus script give by suggesting that ancient Indian astronomy and star lore may be largely of Harappan origin (*Parpola, in press, a*). Since the present book is intended for students of Indian archaeology, I want to conclude by referring to some important results, which in addition to giving further confirmation to the above hinted interpretations are of archaeological interest. While absent in the Avesta and the older books of the Rgveda (the latter composed on or soon after the arrival of the Rgvedic tribes to India), the names of the lunar asterisms (Sanskrit *naksatra*) appear in a complete list in Atharvaveda (1978). It seems quite certain that the Aryans learnt the naksatras in India. While such luni-solar calendars as that connected with the naksatras are not created by primitive or nomadic peoples. (Nilsson, 1920.) they form an essential element in all early urban civilizations (Steward, 1955 p. 194 ff.). The date when the *naksatra* calendar was compiled can be determined by means of astronomical evidence inherent in it: it was in all likelihood around the 24th century B.C. (Needham, 1959, p. 246 ff.), which coincides with the peak of the Harappan urbanization, adding thus one more means for defining its chronology. The orientation of the Harappan cities according to the cardinal points, which could be accomplished by astronomical means only, is tangible evidence for Harappan practice of astronomy. The Dravidian origin of the *naksatras*, on the other hand, seems proved by the long unexplained word *b(h) ekura* or *ori* used as their appellation in the *Brahmana* texts, which appears to be of Dravidian etymology (cf. Tamil *vaikuru-mtn* and Burrow & Emeneau, 1961, nos. 4570, 608). (*Parpola, in press, a, c, d, h.*)

Although the problem of the Indus script still is a very controversial issue, I am confident that with more work and more workers the differences of opinion will gradually be levelled.

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Changing Perspectives of Archaeology and Interpreting Harappan Society

13

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THE CHANGING perspectives of archaeology have been reviewed here in general, and in this context some problems of Harappan society and its organization have also been discussed. These new orientations may be viewed, at the outset, within the four stages of Thomas Kuhn's (1962) evolutionary progression of scientific disciplines, which are as follows :

- (i) A pre-paradigm stage: there are many subjects and schools of thought competing for prominence. In the absence of any common body of belief, or concepts, each researcher thinks about building the foundations of his discipline.
- (ii) Now emerges either a single theory or a set of new theories. These help to both reorganize data as well as provide a set of grounded theories which most practitioners accept.
- (iii) A period of normal science: the basic grounded theories or paradigms are logically explored, tested and discarded.
- (iv) The results of the normal science show sufficient anomalies, to call for tests to be made on the assumptions of the paradigm or its theories until a new paradigm is discovered.

Indian archaeology is as yet in a pre-paradigm stage, with indications that the beginnings of the first explicit paradigm stage have been made albeit work in comparison is far behind Europe and America. In general, in India, archaeological field work, reports and interpretation of data has been always closely associated with history, the arts, linguistics and other disciplines of the humanities, i.e., within the framework of traditional historiography. A summary of the history of archaeological studies in India will bring the changing perspectives into sharp focus.

The development of antiquarian interest may be traced to period I (1784-1861) when Williams Jones started the Asiatic Society, with the aim of systematically enquiring 'into the history, the Antiquities, Arts and Sciences and Literatures of Asia'. Of course, other people before Jones were interested as amateurs in the antiquities of India. But systematic antiquarian research based on literature and supplemented from monuments

and other antiquities was now carried out at Bombay and Madras. Mention may be made of Francis Buchanan who surveyed Mysore, and of James Prinsep who is well known for deciphering the Brahmi and Kharoshthi scripts. Accurate recording of old buildings, and collection of art objects, coins, and epigraphic evidence for museums continued with keen interest in this period. Foote and Le Mesurier had also discovered the first paleolith and neolith respectively. Antiquarian research here may be seen as a consequence of the speculative period—of wonder and curiosity about mankind—in Europe (and later in America) which begins in the twelfth century and lasts until the eighteenth and nineteenth century (*Brew, 1968*). It had greatly influenced the elite in India.

In period II, from 1861 to 1902, following the establishment of the Archaeological Survey of India, antiquarian research objectives continued to dominate the scene. Despite the stress on accurate description Alexander Cunningham, even as late as in 1865, ignored recent developments in excavation and exploration techniques which were taking place in West Asia at that time. Cunningham's work was put on a sound footing in 1872 by James Burgess, with emphasis on the history of art, and architecture.

Period III, 1902 to 1944, is the Descriptive-Historic, which in Europe ranges from 1865 to 1945. Stratigraphic revolution characterises it, for with it come the tradition of classical excavation techniques which were pioneered by Flinders Petrie, Pitt-Rivers and others. John Marshall conducted large excavations concentrating on major historic—Buddhist—sites, with an eye on the public. However, with overemphasis on the search for antiquities, Marshall often ignored the principle of stratified excavations. Pre-historic research continued to receive attention, but the latest techniques improved in Europe and America were also ignored by it.

Period IV, from 1944 onwards, is the Comparative-Historic period, which is characterised by radical changes, both in field work and in interpretation. It is an area of scientific developments initiated by Mortimer Wheeler, who followed up the recommendations made earlier by Leonard Wooley. High standards of research of this period are the inheritance of Indian archaeology, the major objectives of which have been to answer problems of *when* and *where*. As a consequence, archaeological activity continues to yield a tremendous amount of information.

Although during the last two decades developments in science and the application of new techniques, specially Carbon-14 method of dating has started a 'revolution', further problems have been created. It has been found that the enormous quantities of material can no longer meaningfully be arranged in a descriptive-historic manner, in spatio-temporal terms, as was being done earlier. Reports, technically excellent, are dry as dust. In fact, old concepts and terminologies have only complicated matters of organizing, exhibiting and interpreting the vast material. Problems and questions also require careful formulations. These aspects were anticipated by Childe (1956) and Clark (1952), who attempted to describe archaeological material in a Comparative-Historic framework of 'live' societies and cultures.

In recent years, a re-evaluation of the objectives of archaeology has become a major concern, specially in America (*Binford, 1968; Caldwell, 1966; Chang, 1967*). This is logical since there the discipline has more to do with the social sciences. Moreover, the discovery of sites in Central and Southern America (where an independent development of agriculture took place in a different sense than what is known in the 'Old World')

also led to a great deal of rethinking of the basic premises and theoretical issues. W.W. Taylor had earlier (1948) made a great impact by emphasizing the interdisciplinary conjunctive approach. In short, a series of developments have made it clear that fresh theoretical and philosophical foundations of the discipline as well as a revision of ideas about societies, cultures and civilizations and their evolution is required.

During the last ten years it has become transparent that archaeology is not a discipline which merely discovers "facts". It is also essential for it to discuss methodological aspects, and to develop concepts and definitions in combination with intricate and sophisticated field work procedures, imbibing from time to time new discoveries and inventions of the physical and natural sciences. Today, a new generation is devising explicit models, treating archaeology as a separate discipline. Despite considerable increase in the content of cultural chronologies, defined by means of time-space systematics, investigators realize that the framework of research should be a structured one. The trend is to specially study the economic, sociological and behavioural aspects, by not only raising the questions of *what, when* and *where*, but also the *why* of cultural variations. The changing emphasis therefore is shifting from descriptive techniques to verificative ones. Data is so organized that it indicates the empirical validity or non-validity of a hypothesis; empirical results (facts) as such are of no relevance. But the theory or hypothesis itself has to be so logically formulated that it must seem plausible rather than a guess work or a hunch that cannot be discussed at all. In short, the stress is on seeking explanations of various phenomena, of cultures and societies (Clarke, 1968, 1972; Dunnell, 1971; Lee & Devore, 1968).

The cursory survey of the major trends given above, for India specially, tells us that a major influence has been that of traditional historiography, art and architecture. This association continues even today. It has, of course, implicitly borrowed some ideas and concepts from other disciplines. But hardly has any thought been given to the theoretical and philosophical foundations of the discipline. Nevertheless, the goals and objectives of any discipline need to be clarified from time to time, by means of explicit formulation of models or concepts. It is in the absence of this that archaeology is in a confused state in India because its concepts, terms and definitions are a 'mixed bag'. Words and terms are used differently by research workers that it creates unnecessary controversies. It is therefore very essential to be self-conscious about the *how* and *why* of *what* we are doing. This does not mean that sophisticated empirical (field) research has a second place, nor does it suggest that we take over the problems of philosophers as such. But empirical research requires verification by the use of the comparative method, and generalizations require theory and hypothesis. All this, in turn, requires further field work (Plog, 1974; Strong, 1973; Trigger, 1968; Watson, 1971).

We may give an illustration here. Archaeologists use the word culture – and related terms—in various ways. It has not been discussed at any great length, and is used in an undefined manner even though culture is a word which is very crucial for interpreting and describing the evidence. While the definitions and interpretations of culture and its processes have changed over the years in anthropology and the social sciences, even today in India a descriptive record of objects is termed as 'material culture'. But culture or its conception is much more comprehensive than the artefacts that are used as diagnostic traits, which are the symbols of cultures. As a result, the classification of cultural units is defined as an assemblage of artefact traits that reoccur repeatedly, in terms of

'type fossils'. But this makes assemblages mere lifeless accidental types. Therefore, partial archaeological reconstructions are made as a result of the use of restricted definitions. The narrower the definition, the narrower will the research for empirical data be, and also our interpretations. Today, it is because of widening definitions and outlook (concepts) that archaeologists have moved from the technological, to the economic and even to social reconstructions of past societies, opening new vistas of broader interpretations.

The new orientation is not compatible with the traditional empiricist-inductive approach which believes that each trait is a discrete entity with its own inherent meaning. The basic premise with this school has been that each artefact represents ideas, beliefs and preferences, as if material remains are 'real' culture. From this follows the common theory of culture variability and change; that is, since cultural norms are represented by artefacts, changes are as result of new ideas or norms as represented by newer material changes. These are introduced usually by means of 'influence' or 'diffusion' from other cultures mainly by migration, though sometimes by innovation. Hence, the major problem becomes one of finding the origins of cultural traits. This is why archaeological cultures are described in terms of lists of traits. The next step is just to compare assemblages and explain similarities and differences in terms of differential diffusion, sometimes by environmental changes or influence of ideas, and so on. The orientation of field work has also followed these goals, which is to locate the distribution of material traits representing cultural norms, specially the most diagnostic features. This is why, until recently, waste material, small bone fragments and other commonly occurring materials were not noted. Similarly, since emphasis is on observation of cross stylistic variability rather than the functional or adaptational one, analytical techniques have also valued this orientation, affecting sampling techniques.

Following the inductivist approach, field research in many disciplines in India has become a kind of touchstone, at the expense of which there is a total exclusion of theoretical development. There is a kind of 'mystique' that has gone around field work, suggesting '*first field work, than theory*'. This overemphasis has led research workers to completely immerse themselves in describing and classifying empirical evidence. Consequently, each research worker tries to emphasise the uniqueness of his evidence, behaving like an intelligent chronicler. Superficially, factual knowledge somehow may seem more basic, solid and reliable. But the point is, howsoever 'objective' one may try to be observing and collecting 'relevant' facts, by merely this process a theory or hypothesis will not somehow emerge and account for the facts. Facts never speak for themselves or exist by themselves. This is very well known to philosophers of sciences on both logical and psychological grounds. In fact, the increasing amount of overwhelming 'so-called factual' evidence has acted as a deterrent rather than as a stimulant for making generalizations, or even of providing a body of reliable knowledge about various socio-cultural phenomena. Moreover, whenever one goes to the field, we do have concepts in our head, consciously or unconsciously, that help us in the process of observation and inference. This is why facts keep changing in relationship to the question we ask of reality in general, whether this be contemporary, historical or archaeological. It is obvious, then, that research cannot be investigated simply—intuitively—because we, of necessity, make our choices or abstractions from the innumerable human events that are limited by our personal experience, cultural background and other biases which influence research.

Thus, it is obvious today that since the archaeologist has much less data available to him than the anthropologist, he has to have a very broad framework to understand past societies and cultures. Consequently, new theory-like premises, such as the systems theory or ecological approach have been applied. For instance, cultures are viewed as complex behavioural systems made up of sub-systems of components, such as residence units or task units, and so on. Cultural change is not explained by contact but as a result of systematic responses by means of empirically measurable ecological variables, such as inputs, population growth, decreasing food or fuel, locations of critical resources and warfare. Functional 'activity' areas are being described by horizontal or spatial distribution of artefacts, by measuring the degree of randomness of distribution, as well as by measuring differential density of cultural remains. Given this orientation, it becomes necessary to locate a large amount of data, which will be ignored by the traditional approach. An awareness of wider assumptions and theories is necessary because, even if one utilizes very advanced techniques for exploration, excavation and analysis, these will be wasted if the significance and research design has not been well thought out.

The formulation of a problem has to be followed by the generation of specific hypothesis or other testable propositions. Hypotheses are necessary because, (1) to provide the necessary link between problems and the data, and (2) hypotheses testing provides the only efficient means for evaluating the correctness of our inferences. For example, supposing at a certain sites we find specific materials of a particular age, and then find that these sites were later abandoned. If we think that this was due to invasion or shift in the physical environment, then from the records we should be able to deduce very specific expectations of data, if our propositions are correct. But the excavation of several sites and collecting more data will never tell us about the specific reasons for the causes of this abandonment. The well-known instance is the hypothesis of an invasion by the Aryans leading to the destruction of Harappan civilization. If it was so, then evidences to that effect should exist in the data, and that their—Aryan—settlements should be found over a widespread area which are mentioned in the texts, after the abandonment. But no tangible evidence so far appears to support this hypothesis, such as the evidence of warfare, the burning of houses, or other forms of violent activities. Again, if the 'end' was brought about by physical environment such as floods, then the evidence should indicate this by the presence of silt, large scale flooding or other change in the environment as indicated by fauna, flora, agricultural crops, and in the tool kit or their changing relative frequencies. The implications of each hypothesis can be further tested through finer formulations. But if we proceed without any hypotheses, then a large number of items would be missed in observing and collecting data.

Essentially, the approach to archaeological research, and specially interpretation, has to be approached from a social science view point, taking recourse to new research directions and parameters, which are based on world-wide generalizations of anthropological and ethnographical materials. To illustrate socio-cultural change as reflected in traits—both macro and micro—may take place due to internal factors, and/or due to external ideas and cultural contact. But change in cultures or their parts is often due to a complexity of causes; that is, change is differential and unequal in a given culture. On the other hand, trait similarities may often indicate common descent, or linkage due to exchange of ideas through social interaction; or this simply may be due to the use of common raw materials and/or environmental conditions. The latter case is applicable to certain levels of early

societies in which the sub-systems of techno-economics and culture are generally equally influenced by it. Therefore, multiple factors have to be borne in mind when considering both convergent and divergent development of trait assemblages.

While the above brief statement is common knowledge now, several secondary propositions will have to be distinguished within it on the basis of the problem in hand. In the case of India, for instance, an examination of contemporary potter groups may give us certain clues, such as whether women make pottery or men; that it is women who mainly make designs and patterns on pots, and so on (*Saraswat*, 1967). Hence, the spread, from one area to another of certain ceramic design patterns may possibly indicate residence rules of social groups. Similar propositions are available for the technological aspects of pottery-making, which are clearly related to social behaviour. Room size and location of materials *in situ* will tell us about the economic and social nature of a settlement. In this way, 'activity' areas in the excavated sites may be differentiated on the basis of sex division; that is, by identifying male or female task-specific areas. This division is even possible in the case of stone tools, for evolutionary studies tell us that food gathering and collecting during stone age period was the task of women, while hunting was carried out by men.

At another level, generalizations may be made from the ecological view point. For example, social rules and regulations are a consequence of the interaction at different levels of society which govern trade boundaries, and thereby regulate the flow of ideas and goods. These processes often better explain socio-cultural operations rather than large scale migration or invasions which until now have been invoked as chief causes of socio-cultural convergence or divergence. In the case of city civilizations settlement patterns may be easily distinguished in terms of various sub-systems (*Malik*, 1968, 1971 1973, 1975).

A detailed illustration is given below, in the light of this section, for interpreting certain intangible aspects of Harappan society, and its organization.

An Example : Interpreting Harappan Society

The entire object of remarks in the first section is to point out that the interpretation and reconstruction of archaeological empirical evidence requires a very wide perspective, of a framework of ideas in general. It is in this context that several socio-cultural propositions are given below which may help us to infer social, social-religious and political sub-systems of Harappan civilization. This is so because, it must be specifically noted, that these sub-systems cannot ever be physically excavated i.e., like tangible evidence of houses, ceramics and other objects. Socio-religious and politico-economic systems can only be inferred and reconstructed by logical arguments, within an awareness of the functioning of societies as a whole. Certain of these propositions, given from the perspective of evolution, may then be tested both logically in terms of models as well as in the field. Since archaeological facts about Harappan society are much too well-known, these will be mentioned only where relevant.

(i) SOCIAL SYSTEM

In human societies, social and religious sub-systems are functionally inter-related,

just as we know that there is a close relationship between socio-economic sub-systems and politics. The degree of such relationships depends upon the level of the society under consideration, and its complexity. Social inferences, in the case of Harappan evidence, may be made on the basis of the degree of specialization which is seen in craft and technological advancement, population size and other evidences which focus on economic sub-systems, ritual areas, ceramic centres, and so on. Urban social complexity is further indicated by cemeteries associated with different grave goods, etc., and their variation. This is also indicated by the variation of house types, in the room sizes, types of hearths and locations, other domestic objects found in actual location, and so on. To some extent, artistic representations also suggest political and religious patterning by the manner in which the secular and the sacred structures are located.

Social differentiation is thus in evidence typically not only in the urban areas, but also in the surrounding villages. Of course, the resemblance may end here, since it is known that a small village may also indicate a single lineage organization, while segmented large villages, in all probability, suggest multi-lineage organizations. However, large towns and cities do clearly indicate several classes, which are usually organised on kinship and hereditary groupings.

(ii) ECOLOGY AND RELIGIOUS FUNCTIONING

Because economic sub-systems as they are adapted to the environment tell us a great deal about socio-cultural systems, archaeological evidence for religion may be seen as a function of the ecological system. For example, at very simple levels, religion is often almost entirely a ritualization of ecology; that is, religion is a medium whereby nature and natural processes are placated in order to secure the best results for man (viz., cave paintings). In simple ethnic religions, since ecological relationships are intense with nature, plants and animals, sacred structures are neither widely nor consciously distributed. This is because there are no special objects, as structures, that may be identified exclusively to be religious. Of course, depending upon technological efficiency, the interaction of landscape to monuments becomes complex, as the complexity of societies increases. But monuments are often built beyond economic and technological capacities. Since the allocation of resources for this purpose is made quite out of proportion to the economy, labour, and skill available, this is why several simpler societies all over the world build monuments beyond their obvious 'simple' organization and techno-economic level. Very often such buildings as magnificent monuments, temples and other structures that we see not only in India but other parts of South East Asia (for instance at Angkor-Wat) are built beyond the capacity of that society. This function, beyond utilitarian needs, often leads to ecological imbalances which have even brought about an eclipse of civilizations. Consequently, when large monuments are discovered, it does not necessarily suggest complexity and a stratified social order. This will depend upon how much allocation is given for this work in different forms of societies because even a lack of centralized political system in a complex society can produce monuments of considerable size. Contrarily, many urban areas need not necessarily build large monuments, comparable to the skills and labour-economy backing that is available.

At any rate, as we proceed from nomadic to semi-sedentary, and to sedentary agricultural societies there is an elaboration of rituals. Of course, rituals of earlier times are

- (a) In small isolated primitive levels of society terminology is chiefly egocentric and familistic, because initially internal social relations are predominantly face to face and consistent.
- (b) With intensive agriculture, when tribal societies of the first stage become supra-tribal, then non-familistic terms begin to emerge. Beyond domestic—nuclear—families, now arise larger families which exist in terms of relationship of larger groups. But this is as yet a transitional phase that leads to specialization.
- (c) With the beginning of urban life, of the pre-industrial or non-industrial type, there emerge complex socio-economic classes along the lines of the rich and the poor. There is also a hierarchy, specially of political or bureaucratic offices, in terms of the differentiation of social class. This stage seems likely to be applicable for Harappan civilization. Now, kinship terms are egocentric and non-familistic; both arising out of hereditary position, or because of relations to other persons who have status or titles that are socio-centric. In other words, supra-kinship orders are formed, which refer to non-familistic status that emerge due to corporate groupings such as 'castes'—classes—and guilds based on occupational specialization. Of course, both egocentric and socio-centric familialistic terms continue to be used.

This is a general definition of the third ideal stage. But, in fact, this stage covers several hundreds of societies that represent extreme heterogeneity; ranging from supra-tribal groups and infra-industrial systems, to not only include Harappan type of civilization but also city-states of Mesopotamia and Greece, as well as colonial empires and feudal kingdoms of much later stages. Therefore, specific investigations have to be carried out in the Indian region, at least to initiate certain inferences within which broad details of Harappan evidence may be examined for kinship and other social aspects.

We are not concerned with fourth stage, for it belongs to the industrial society.

(vi) URBANIZATION OF HUMAN SOCIETIES

In recent years, anthropologically oriented archaeologists, such as Adams (1966) have evolved working definitions of civilizations based on social science literature, rather than merely on archaeological evidence. This has been done specially in the light of the discovery of civilizations in South America, where "old world" definitions are contradicted. For example, while urban life and writing are two clear indicators of a civilization, this does not apply to South America where complex settlements are found with monumental architecture without these indicators, and even have different subsistence-economies than in our areas. Hence, it has been found feasible to define civilization as functionally interrelated areas of social institutions which imply class stratification. This implies power and economic focus which is marked by a highly developed degree of ownership, or control of main productive resources, in such a way that politico-social hierarchies complement each other in the administrative territorially organized units such as cities or states. This is based on a complex division of labour in which full time craftsmen, soldiers and officials exist along side a great mass of primary peasant producers.

While the above description is based on the characterization of Mesopotamia and other areas, it is clear that we may develop a similar complex model for the origin and

formation of Harappan civilization. Here, we should also bear in mind that civilization was not invented in one area, since it is known that cities range from West Asia to the Indian subcontinent, at a certain point of time. We know that trade was controlled by distinctive administrative centres which are revealed at such sites as *Tepe Yahya* and *Namazga Tepe*. This suggests that various civilizational spheres were interacting with each other at cultural, economic, social, political levels. Similarly, these ideas spread to other parts of India or interacted with other cultures, giving the distinctive flavour of 'Indian Style' (Malik, 1968).

Thus, clues to Harappan society may be sought in examining evolutionary processes whereby village communities were transformed into cities. This urban stage signifies radical economic and socio-political changes. The economic base is very crucial, for now come into existence efficient means of production, including metal technology and alloys which were systematically exploited. This was possible because of the presence of specialists in the non-agricultural population. The extensive evidence of trade, economics and commercial exchange implies equally extensive developments in the realm of socio-religious and political sub-systems of material and ideological exchange. We know that between West Asia and Indus Valley settlements, such exchange or exchanges were taking place. Intermediary regions gave impetus to trade, controlled the exchange of raw material, metal technology and various goods. All these processes taken together led to different levels of socio-cultural complexities, and to that of urban evolution.

Significant developments were also taking place in the villages, for the peasants were now closely associated with urban areas, which were the main focus of economic, commercial and politico-administrative sub-systems. In this context Lamberg-Karlovsky (1972) has discussed various aspects of trade between the Indus Valley and Mesopotamia, which in the wider sense means a 'reciprocal traffic of materials or goods directed by human agencies from one place or individual to another', in terms of direct contact, exchange and central place trade. It is interesting to note that informal non-centrally administered processes, both diffused as well as gave impetus for the development of socio-political relations not only between West Asia and the Indus but also within the sphere of each civilization. Thus, it is by the beginning of 3000 B.C. due to the stimulus of reciprocal trade and of the sources that there is a nucleation of such centres such as Kulli, Amri, Kot-Diji, etc., leading to a culmination in the mature Harappan civilization. Of course, the main point to note is that resources, materials, economic relationships and demand for luxurious articles, raw materials and mineral ores was a substantive one. It helped in the development of complex of socio-political economic structure in the Late Uruk period, of Mesopotamian city-states; and, that the areas of South Western Asia and Baluchistan may have played an important role in generating the processes of concomitant socio-political development as a feed-back system. It is in this context that the explosive emergence of Harappan civilization may be misleading as has been suggested earlier, for the borderland sites represent the embryonic urban forms of social organization.

(vii) GENERAL INTERPRETATIONS

In the complex planning revealed in the Harappan cities and associated villages, the interdependence of various groups within some common framework of socio-political

ideas is implied and obvious. As suggested above, there is little evidence of a single supreme authority that governed the entire civilization as has been generally assumed. Nevertheless, the complex of each city and its associated villages required distinctive social class or classes—ruling ones—which could have maintained civic life, and the discipline of social life. The existence of economic-technological classes of specialists clearly suggests this. Apart from a 'ruling' social class, there were specialists in architecture, astronomy, mathematics for not only was it necessary to maintain records for commercial transactions, but also to plan out carefully the purely physical aspects of city-planning, and traders who carried out commerce both internally and externally. Since in all complex societies some socio-religious sanctions do provide incentives to various classes, in order to maintain their positions by hereditary—primogenitor—means, violent coercive methods for maintaining order is not necessary, nor is there evidence for it. Therefore, discipline was enforced by ideological reasons, or by a superstructure of values.

It is apparent from social science literature that until the beginning of industrialization, such socio-religious means were the major controlling factors that enabled continuity of tradition, of craft, technology and occupations—which were passed from father to son, which also maintained social identities that sustained the general structure of society. In all probability this kind of system of ideas of socio-religious and political control were present, with variations, not only throughout the area of Harappan civilization but also in the neighbouring areas towards west Asia, and hinterland eastwards. Therefore, it is not necessary to bring in ideas of imperial authority for which there is no evidence in any way. To many, on the other hand, the uniformity of Harappan patterns in material remains has suggested a central empire with a kind of authoritarian government—or a totalitarian regime. But not only is there the absence of clear cut evidences in archaeology, these kinds of inferences and arguments are also logically wrong, and have no basis in social sciences.

The statements made above by us are substantiated by some of the well-known major features of Harappan areas. To briefly recapitulate, the urban areas are characterized by a 'monotonous' rigid regularity of blocks after blocks of brick houses, with broad main streets (drains, etc.); varying buildings with high technical and architectural standards. City settlements range in an area of three to four miles in circumference, and many of these general features were also present in Mesopotamian areas. All these features continue in their materials and techniques unchanged ('dull'—'lack of colour') for several centuries. Several Harappan features are present in what has been called the 'pre-Harappan' settlements—both in the Indus valley region, Gujarat and the Rajasthan area. The villages have also maintained a continuous uniformity, as in the urban settlements. There are clear regional differences both of the 'pre-Harappan' and Harappan cultures, which are spread out over vast areas, in terms of hundreds of miles. But despite regional diversity, by and large, there is a pattern of the material products, general planning, etc., which is reflected in the well-planned cities, public buildings, defence walls, large fortifications, granaries and standardization of material equipment through mass production and so on.

The uniform pattern (of planned areas and their division into specialized areas) indicates more the possibility of the continuity of tradition through descent rather than by means of superimposed sanctions of political leadership. Similarly economic focus, as

suggested by granaries, indicates provision for labour control provided by municipal facilities. Evidence of trade and exchange reflect wide ranging activities which is possible due to the continuity of social classes, and their occupations. This specialization of hereditary arts, crafts and technology is normal in corporate groups when occupations are handed down from father to son. This has been the case throughout human history until the last two centuries which have been affected by industrial civilization. The continuity of residential groups also suggests hereditary occupational traditions. Social planning is implied in the planning of the cities specially to see that civic and social order was maintained (*Wheeler 1953, 1959, 1966*).

Apart from the data, in terms of evolution we learn that with the beginning of urban organizations there is a distinct change from the earlier simpler societies (which are kin-based in their social organization), to a hierarchy system of a socio-economic structures. It is this stratified society which is a form of political organization that is necessary to control the division of labour, etc. Here, invoking control through the concept of an 'empire' is not necessary. Similarities in social and cultural patterns may be simply because of the use of similar political systems and authorities of administrative units in different city-areas. This can be both due to the spread of certain ideas, with the evolution of city civilizations and or the evolutionary development of socio-cultural complexities that bring about uniform functional interaction and institutionalization of the distinct cores of social systems. This seems more appropriate in the context of contemporary knowledge of understanding successive organizational levels in the process of settlement patterns within the wide ranging villages-urban complexes. This is why uniformity does not always simply that the model of political 'empires' be brought in. While political authority in urban areas is necessary, it often functions more because of complex social stratification and institutionalization of norms and values of socio-political control rather than coercion. Hence, material uniformity and planning does not imply any unitary common socio-political authority. Authority in this case seldom existed solely in political terms, for it is interrelated with religion or religious authority which maintain rites and rituals. As we know, today, many of the cities in the world have a common pattern of planning and other arrangements, but the socio-political system on which they have been built range from democratic to totalitarian regimes. Of course, we must look at urban areas that existed at pre-civilizational levels. For example, while we may say that there was the beginning of class society, it was in the sense of hierarchical differentiation in the means of production rather than class-consciousness or interclass struggle as such.

It is, hence, clear that, apart from political authority, social rigidity and disciplined behaviour was maintained through social norms and values—rather than by political 'empires', although the existence of religious-cum-political leaders belonging to priestly class is more likely than any secular political authority. Lack of any clear political authority is also indicated by the lack of any outstanding monuments (including tombs or burials), or supreme gods and other sacred objects which are supreme and would suggest a totalitarian government. Nevertheless, it does suggest socio-political groups which were aware of critical and selective of their own society. Further, there was by Harappan times a certain system of common ideas which were prevailing over a vast area not only in the main Harappan areas but also in the neighbouring areas of the subcontinent, beyond the Harappan spheres. We have also to bear in mind that in each geographical area such

as in the Indus valley, Rajasthan, and in Gujarat area (and beyond) there is clear socio-cultural continuity as reflected in various agricultural crops, craft technologies such as in pottery, the way houses are built in villages and material used and so on.

In short, what we have tried to do is to discuss the most probable ways, according to the available evidences as well as canons of interpretations both in historical and social science disciplines, whereby certain socio-political ideas may be interpreted for Harappan civilization. This has taken into account what already exists in later Indian civilization which in turn was the result of the great deal of the impact of the Harappans. With more work and interpretations these ideas may be further clarified, but for which we have to evolve more sophisticated and refined concepts and framework than have been attempted until now.

Summary and Conclusion

The review above, with an example, indicates clearly that the changes envisaged by 'new' archaeological perspectives is one of approaches, and not merely of general or specific methods. The debate is still on as to how far the changes in the basic foundations do amount to a "new archaeology". Despite this, there is a fundamental difference in the method of examining past evidence; whether one should proceed inductively or in a deductive manner. Briefly, the inductive approach of traditional archaeology suggests that the material evidence that exists in the world has meaning in itself, without any need of a frame work of concepts. This implies thereby that if an investigator collects sufficient data, he will get a picture of the past, or the nature of the inter-relationship of the evidence. On the other hand, the deductive approach suggests that we must have a problem-orientation for the collection of our data. Since it is apparent that we already have something in mind when we investigate data, either in the laboratory or in the field, interpretations depend upon our academic training, our social background and other influences. Therefore, what the data is and what it reveals depends upon how clear we are about what we have in mind. For this is only way we may test our problems and hypotheses in a wider perspective.

The deductive approach is more efficient in terms of getting answers to questions which is not possible in the inductive approach, where one proceeds in an unknown blind manner using guesses and hunches. It is evident that guesses and hunches are already governed by implicit and unconscious concepts in ideas whereby we collect a large body of basic data, and this is a severe limitation to the infinite amount of potential data that exists, and even effects and limits our analytical techniques. Moreover, in the case of the inductive approach, the data, the method of analysis, the interpretations and hypotheses formation are all carried out separately, without much thought or inter-relationship, i.e., what traditionally we do as separate steps are in this order :

- (1) Excavate or explore or collect data;
- (2) Classify and place it in a chronological order;
- (3) Analyse; and
- (4) Interpret.

The objection by 'new' archaeology to the traditional approach is that it allows

one to collect indiscriminately all data without any further thoughts. It implies, as if field work can be adequately carried out by any man, with technical expertise, who has no interest in theory, problems and so-forth. This has been the case in India where sometimes the peons and even technical assistants are often far better as collectors, observers, explorers, or even as excavators, than the academician. As a result the traditional approach has allowed the development of archaeology to remain static, intellectually.

Consequently, theory in archaeological research is important because it makes us systematic, which avoids a great deal of wide spread reduplication. This is why a well thought-out, logically formulated framework is essential, if researchers have to understand each other. Ideas then do not remain scattered and unrelated, as today, in reports, which then are often lost or forgotten. At least, as a beginning, a great deal of waste may be avoided if some basic issues are discussed with explicit awareness, and this is akin to a procedure followed by philosophers of science. This matter of keeping the questions well sorted out is important if we bear in mind that these are the ones which are common to archaeology, anthropology, sociology and history; all of which deal with phenomenon of man. For instance, common questions may refer to evolution and its problems and about innovations and change, or of inventions or of diffusions and so on. In fact, this asking of questions in a very wide field will help us to locate greater empirical data, and this has been so wherever and whenever broader issues have been discussed and thought of.

The view of changing perspectives in archaeology is therefore fundamentally different, since it states that the meaning given to artefacts and other features is not inherent in them but is an aspect of the human mind at all levels during research. This is, of course, even true in ordinary life. The question is of testing and communicating our views and meaning by various sophisticated analytical means that need to be constantly sorted out, re-written and even discarded. This holds true both for theory and also of any new evidence that is discovered. This does not mean that the 'new' archaeologist ignores or fails to see the obvious in the field since he has only a set problem or hypothesis in his mind. It is imperative for him to keep open his mind, to modify his ideas when faced with new or unexpected kinds of observations. *It is crucial to remember this interaction that is an essential feature of the new approach.* The point is that each one of us thus have certain biases and favourite ideas which we try to investigate and discover, and these we should be quite clear and explicit.

Unfortunately, by and large, the view prevails in India that it is obligatory--and in a way compulsory--to first be involved in data collection even when one is being trained as an archaeologist, before anything else can be learnt. However, it is clear from research during the last two decades that with the use of sophisticated scientific techniques, potential data has increased the inventory: reports have become bigger and bigger with various specialists writing on each separate section. Nevertheless, while facts have become infinite, they reveal no meaning since there is no inter-relationship or any idea of the problems to be solved. The reports therefore are never complete as one expects them to be, for there is always some other aspects which remain left out. But not only is the physical possibility to observe, collect and record all the potential data limited, our ideas are also limited by the mind and its potentialities. If these limitations are inherent, then the entire debate implies that there is no such thing as a collection of evidence free from bias. This is why we have to learn to refine our basic premises albeit inevitably they are

subjective in the sense of having arisen out of our minds. Of course, these are verifiable through the current canons of knowledge, and their logical validity.

Finally, relating Indian archaeology with anthropology will help us to broaden its perspective rather than by a continued relationship to traditional history. Ultimately, what we are trying to recover—and discover—is the past of India in order to understand its culture, society and civilization. Today, in many research centres, as it is, history is part of the social sciences itself, so that the claims of archaeologists to follow the old pattern of association with history—as humanities—is quite outdated. Being more specific, the difference between archaeology and other disciplines of social sciences, which include sociology and anthropology that examine the current society, is in those of techniques and not in the general questions raised. This is why sociologists and anthropologists are more involved with the time dimension of the societies they work on since they seek latent structural forms that are universal to human societies. In short, the suggestion is that several different approaches be adapted to study the phenomena of the past, specifically in the context of archaeology, by means of self-conscious development of theory and methods of comparison and analysis. What archaeology is, will be determined by its perspectives rather than restricted by a mere descriptive account of the data recovered in the field.

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Size of the Harappan Settlements

14

DILIP K. CHAKRABARTI

THERE IS no detailed gazetteer of the Harappan sites available and most of the sites are only perfunctorily reported. Pande and Ramachandran (1971, pp.37-43) listed 258 sites in 1971. While some sites—Vainiwal (*Pakistan Archaeology*, 1964, p.7), Rahman Dheri (*Dani*, 1971, p.28), Gharo Bhiro (*Mughal*, 1973, p.3) etc. should now be added to the list, there is no assurance that all of these 258 sites should strictly come under the category of the Harappan. Most of the sites in east Panjab are generally so ill reported and ill illustrated that one has often to wonder what is so specifically Harappan about most of them. In the Sutlej valley Dikshit (1967, p.568) could specifically identify only two Harappan sites. In Gujarat not all the sites reported by Rao (1963) may be Harappan. For instance, Leshnik's (1968, p.302) subsequent exploration failed to locate the site of Sujnipur earlier mentioned by Rao (1963, p.389). The site of Malvan explored by Allchin and Joshi (1970) may not be, according to Allchin and Joshi (1970, p.27) themselves, a specifically Harappan settlement. They believe that no definitely Harappan objects have so far been found in coastal mainland Gujarat and that the Harappan sites discovered in this area should be considered post-Harappan. This is in no way to suggest that the Harappan sites are being reported in areas where in reality there are none : in fact, the basic element of the present wide distribution area of the Harappans is never in doubt. But the point which needs emphasis is that there should be a detailed inventory of the Harappan sites and this may be the first step towards a proper study of the Harappan settlement pattern.

There is also no study of the comparative stratigraphy of the Harappan sites. The present trend of assigning, 'early', 'mature' and 'late' labels to different sites is possibly based on the flimsiest evidence. The distinguishing criteria of each of these levels have never been systematically analysed and described, except for some cursory references to a few ceramic types which are supposed to be the features of a late level Harappan occupation (cf. Wheeler, 1968, pp.97-98). Any study of the Harappan comparative stratigraphy should now first be regional and then the regional details should be pieced together to form the over-all pattern. Unless a comparative stratigraphy is established in detail there is no way of determining how many Harappan sites were flourishing at any specific point of time and in which areas. Among other things this is also an important element of any proper

study of the Harappan settlement pattern.

The concern of the present brief essay is only the size of the Harappan settlements as available in the publications. The data are set forth in a chart and a histogram. It may be noted that more or less unambiguous data are available only for 35 sites, roughly only one eighth of the total number of reported sites. The publications are distressingly inadequate on this score, not to speak of others. Occasionally the reported measurements do not seem to bear much relation with the reality. The size of the mound of Rangpur is given as roughly 3600×2800 ft. (*Rco*, 1963, p.7). When converted into square metres this means about 9,35,741 square metres and this makes Rangpur larger in area than Mohenjo-Daro or Harappa. But a rough computation based on the published plan suggests that it is more nearly 1000×2500 ft. at most, and it is far from clear if the entire area of the site was occupied during the Harappan period. Rangpur has been ignored in the present chart. Joshi (1972, p.108) described the area of the mound of Kotadi as .75 square kilometres. This makes it 7,50,000 square metres. But he also gives the specific measurements of its two mounds, 100×150 m. and 500×250 m. The total area of the settlement on this basis is only 1,40,000 square metres. Beatrice de Cardi (1964, p.28) once referred to a site called Pathani Damb at the mouth of the Mula pass which, she thought, could rank with Mohenjo-Daro and Harappa as a metropolitan centre of the civilization. Nothing more has been heard of the site since then. No measurement is available for any of the east Punjab and *Doab* sites. Examples like this may be multiplied and suggest in one more way the inadequacy of the present published data. The point at issue, however, is : do the published data on the size of the Harappan settlements suggest anything beyond the mere element of size ?

To begin with, one may speculate on the population of some sites. Taking the population estimates for Mohenjo-Daro as an index one may speculate on the number of sites which were likely to contain at least more than 5000 people. There are three estimates for the population of Mohenjo-Daro and one specifically for Harappa. On the basis of his estimate of the quantity of grain stored in the granaries which, he thought, was used only for the general civic consumption, Datta (1962, pp.9-10) calculated that the density of population per acre at Mohenjo-Daro and Harappa was 52 and 73 respectively, giving a total population of 33,469 for Mohenjo-Daro and 37,155 for Harappa. Allowing a ratio of 800 square feet per person Fairservis (1967, p.33) put the total population of Mohenjo-Daro at 41,250 and considered this figure to be on the conservative side. For Harappa he (*Fairservis*, 1967, table 2) makes a total of 23,544 without taking the citadel mound into consideration. On the basis of a nineteenth century statistics for Shikarpur in north-west Sind, which, he thought, closely resembled Mohenjo-Daro both in dimensions and lay-out, Lambrik (1964, p.71) estimated the total population of Mohenjo-Daro to be 35,000 and felt that this could apply to Harappa as well.

Accepting Lambrick's estimate of 35,000 as the population of 850,000 square metres of Mohenjo-Daro and assuming that the density of population in other settlements was more or less the same, one feels that the settlements having an area of 1,25,000 square feet or more were likely to possess 5000 or more people each. The sites which seem to belong to this group, besides Mohenjo-Daro and Harappa, are Naru Waro Dharo, Judeir-jo-Daro, Dabarkot, Rahman Dheri, Dewalina Ther, Lurewala, Trekoe, Kalibangan, Devaliyo and Kotadi--in fact, twelve in all. The evidence of Naru Waro

Dharo may, however, be treated with doubt as this does not seem to be a permanent settlement (*Pakistan Archaeology, 1964, p.43*). On the other hand, a few more settlements may be added to the list though none of them figures in the present chart and histogram. Some doubts exist about their precise measurement. Two sites in the Ghaggar-Hakra system—Kudwala and Derawar, both reported by Stein (1942, p.181) to be big settlements may come under this category. They do not seem to be smaller than Lurewala and Trekoe in the same area. In Kutch three sites Lakhapur, Jhangar and Kotada-all seem to be roughly equal in size to Kotadi, though Joshi (1972, 111-112) did not give any precise measurements in these cases as he did in case of Kotadi. They may also belong to this group. The number of this group of sites may thus be about 17 on the existing evidence. One can possibly say with some emphasis that there were at least 15 Harappan settlements with more than 5000 people each. The number is likely to be somewhat more when the full data are available for most of the sites.

A second point which deserves notice is a greater concentration of the large sites in the central Indus system, broadly in and around a rough triangle with Mohenjo-Daro, Harappa and Kalibangan as its three points. Mohenjo-Daro, Harappa and apparently the sites like Lurewala, Trekoe, Kudwala and Derawar are no doubt the largest Harappan settlements, and these including Kalibangan seem to make this particular stretch of the Harappan distribution quite significant. This seems to be an area which should repay close and intensive study in the field. Though the size of the settlements between the Sutlaj and the Yamuna is not available in the publications one has a feeling that most of them were small category settlements. This is borne out by Suraj Bhan's work in the area. According to him "the distribution of the Harappan sites in the Sarasvati and Drishadvati valleys reveals that the Harappa culture falls into two zones, A and B, the former comprising north Rajasthan and the adjoining districts of Hissar, Rhotak and Jind in Haryana and was contained in the east by the old westerly course of the Yamuna river. The Zone B included the late Harappan sites above of Vanawali in the Sarasvati valley and Alipur Kharar in the Drishadvati valley, both in Hissar district. The latter zone extended into the Siwalik hills in the north and over to the Ganga-Yamuna *Doab* in the east. The two zones, however, overlapped in parts of Hissar, Rhotak and Jind districts" (Bhan 1972, *unpublished*).

What needs notice is that all the three Harappans sites with twin mounds in this entire area—Mitathal, Rakigarhi and Vanawali—were located in Suraj Bhan's Zone A, in other words, an area immediately peripheral to Kalibangan. If one compares the natures of settlements in Kutch and the rest of Gujarat one notes a fewer number of large settlements in the second area. Only Devaliyo stands out. In Kutch there seems to be at least four fair-sized settlements—Lakhapur, Jhangar, Kotada (Bhadli) and Kotadi. In addition, the lay-out with twin mounds is visible on the surface of three Kutch sites—Kotadi, Kotara (Juni Karan) and Kotada (Bhadli)—apart from the excavated specimen at Surkotada (Joshi, 1972). No site in the rest of Gujarat is yet found to have this feature. It may be noted that Lothal does not possess twin mounds. It looks plausible that Kutch was a more significant area of Harappan distribution than the rest of Gujarat. Considering the nearness of Kutch to Sind this does not seem to be an improbability.

What also seems striking is an almost obvious fact that the basic elements of the Harappan planning seem to be present in all settlements, big or small. At one end of the

scale there are sites like Mohenjo-Daro and Harappa with their large population and the classic elements of the Harappan civilization while at the other end there are sites like Sutkagendor and Kot Diji which are among the small Harappan settlements with hardly more than a thousand inhabitants and yet possessing some of those distinctive traits of planning which are associated with the largest settlements. Sutkagendor possesses a fortified 'citadel' with bastions while even the limited excavations of the Harappan level at Kot Diji suggested, according to its excavator "a well-regulated town-plan with lanes" (*Khan, 1975, pp. 17-19*). Neither of these two sites has revealed any evidence of writing but that may be only due to the limited nature of excavations. Surkotada was hardly larger than any of these. It contained not merely evidence of systematic planning but also two inscribed seals and what is possibly more significant, fragments of potsherds with some signs of Harappan script painted on them. This latter evidence is the only one of its kind but this seems to suggest that the Harappan literacy need not be as limited as it is generally supposed to be. Rao's claim for a population of 15,000 notwithstanding (*Rao, 1973, p. 152*). Lothal was unlikely to have contained more than 2000-2500 people and yet this stands out as a magnificent example of Harappan urban planning and cultural traits, though, of course on a much smaller scale than that of Mohenjo-Daro. Chanhу-Daro was not much larger and surely did not contain more than 5,000 people on the existing evidence but all the basic traits of a Harappan settlement were here.

This feature may be said to provide some clue to the nature of Harappan urbanism. Sjoberg (1967 p.35) defines a city in the ancient context as "a community of substantial size and density that shelters a variety of non-agricultural specialists including a literate elite". The attributes of "substantial size and density" cannot be precisely defined and this definition is useful only in a broad sense. According to Kluckhohn (1960, p.400) an urban group should possess at least two of the following features : settlements of upward of 5,000 people, a written language and monumental ceremonial centres. Renfrew (1972 p.7) has called this "a definition in explicitly polythetic terms".

It has been argued in the present context that at least 15 Harappan settlements had a population of more than 5,000 and possessed by inference (not all of these sites are excavated) the other two features also. Some of the smaller sites might not have had that number of population but they had both ceremonial centres (that the 'citadel' complex had a ceremonial function as well is amply documented at Kalibangan) and evidence of written language. The trend seems to continue down to the smallest group of settlements. This raises by itself an intriguing problem : how would one then conceptually distinguish between a Harappan urban and rural settlement ? A precise categorisation is possibly not necessary : one may simply judge by the over-all cultural assemblage. For example, both Lothal and Chanhу-Daro were not centres of substantial size and population when contrasted with Mohenjo-Daro but shared with it many urban features like the existence of non-agricultural specialists including the evidence of a literati (cf. the evidence of seal-manufacture at both these sites). There is no reason why Lothal and Chanhу-Daro should not be called urban settlements even though they possessed much less than 5,000 inhabitants. The determination of precisely how many Harappan settlements were urban will depend on a much larger sampling of the sites and possibly only then will reasonably precise criteria of urbanism in the Harappan context emerge.

The fact which is in a sense more important and which is rather clear even on the

basis of the present limited evidence is that in the Harappan context the distinction between a village, a town and a city was to some extent blurred; one suspects that it was more a matter of scale than of anything else. Fairservis (1971 p. 300) pointed this out before and this is precisely the conclusion one reaches even after a preliminary study of the size of the Harappan settlements such as this. As Fairservis (*ibid*) has put it, "if our faint evidence is correct, the Harappan villages and towns are really only the "cities" in miniature, and conversely, the cities appear to be elaborations of the village in plan and activity...". Whether this means, as according to Fairservis (1971, p. 299) this is supposed to mean, that the Harappan ethos was "more village-like than city-like in the Western sense" will always be a debated problem; after all any ancient city carried within it a lot of village. Besides, there can hardly be said to be any absolute set of criteria by which urban ethos can be measured and compared. But this feature of the Harappan civilization cannot be ignored and this remains to be cogently explained.

One may emphasize here one more general feature of the Harappan settlements. There is not a single settlement, large or small, which may be said to be the centre of a cluster of smaller settlements in its immediate neighbourhood. Fairservis (1991 p., 16) thinks that Mohenjo-Daro lies at the heart of a cluster of smaller settlements, and this cluster appears to become denser as one moves to the centre". The present data do not warrant such statement. As the detailed map of the area around Lothal clearly shows, there is not a single contemporary settlement within a radius of quite a few miles of Lothal (Rao, 1973, fig.10). The distance between the Harappan settlements should make an interesting study but even on the basis of present understanding one can say that every Harappan settlement had around it a considerable tract of land for its own use. It is highly probable that the basic subsistence of a settlement was derived from the utilization of this land. Trade and craft-specialization surely contributed to its general prosperity but in no way separated the settlement from agriculture and other basic subsistence activities. At the same time it may not be difficult to distinguish settlements where non-agricultural pursuits were more important than they were at others. Anyone who is familiar with both Kalibangan and Lothal must have realized that though Kalibangan was the larger of the two it was less prosperous with its uniformly mud-brick houses in the 'lower town', almost a total absence of burnt-brick drains outside the "citadel" area and a comparative paucity of finds. Lothal was smaller but its houses were mostly of burnt-brick and it also possessed most of the 'civic amenities' which in the Indus context one generally associates with Mohenjo-Daro. Its artifactual wealth also is more plentiful. Whether the Lothal "dock-yard" was really a dock-yard or not, there is no particular reason to deny that trade and craft-specialization formed a more significant part of Lothal than they did at Kalibangan.

The Harappan studies are still largely concerned with the over-all pattern of the cultural assemblage. But as there is very little specific, problem-oriented emphasis on the regional and other details the present knowledge of over-all pattern lacks very often depth and proper perspective. The purpose of the present largely speculative exercise with only the size of the settlements as its central concern has been to emphasize how the study of the settlement pattern and units should occupy a far more important place in the Harappan research than it has done until now.

Acknowledgement

Grateful acknowledgement is due to Dr F. R. Allchin who read the paper in the draft stage.

Published Data on the Size of the Harappan Settlements

<i>Site</i>	<i>Size as Mentioned in Reports</i>	<i>Size in Metres</i>	<i>Size in Square Metres</i>	<i>Reference</i>
Mohenjo-Daro	1300×670 yards ¹ 440×330 yards	1188.72×612.648 m. +402.336×301.752 m.	848058 or roughly 850000	(<i>Mackay</i> , 1935, p. 8)
Ali Murad	1100×1000 ft. ²	335.2×304.8 m.	101840 or 100000	(<i>Majumdar</i> , 1934, p. 89)
Chanhudaro	1000×700 ft.	304.8×213.36 m.	64752 or 65000	(<i>Piggott</i> , 1950, p. 171)
Karchat	750×680 ft.	228.6×207.06 m.	47196 or 50000	(<i>Majumdar</i> , 1934, p. 129)
Lohumjodaro	900×600 ft.	274.3×182.88 m.	49886 or 50000	(<i>Majumdar</i> , 1934, p. 48)
Nokjo-Shadinzai	900×900 ft.	274.3×274.3 m.	75076 or 75000	(<i>Stein</i> , 1931, p. 152)
Mehi	1080×990 ft.	329.184×301.752 m.	99029 or 100000	(<i>Stein</i> , 1931, p. 154)
Pandi Wahi	450×350 ft.	137.16×106.68 m.	14522 or 15000	(<i>Majumdar</i> , 1934, p. 91)
Thano-Bula-Khan	600×450 ft.	182.88×137.16 m.	14934 or 15000	(<i>Majumdar</i> , 1934, p. 142)
Kotasur	1100×600 ft.	335.2×274.3 m.	91790 or 90000	(<i>Vats</i> , 1935-36, p. 37)
Naru-Waro-Dharo	2500×1500 ft.	762×457.2 m.	347234 or 350000	(<i>Pakistan Archaeology</i> , 1964, p. 43)
Theri Bahadur Shah	690×600 ft.	210.3×182.88 m.	38120 or 40000	(<i>Pakistan Archaeology</i> , 1965, p. 6)
Judeirjo-Daro	1800×1500 ft.	548.14×457.2 m.	250436 or 250000	(<i>Pakistan Archaeology</i> , 1964, p. 11)

Kot Diji	600×400 ft.	182.88×121.92 m.	22022 or 22000	(<i>Pakistan Archaeology</i> , 1964, p. 39)
Sutkagendor	570×339 ft.	173.736×103.327 m.	17819 or 20000	(<i>Wheeler</i> , 1968, p. 60)
Dabarkot	1500×1350 ft.	457.2×411.48 m.	187827 or 200000	(<i>Stein</i> , 1929, p. 56)
Rahman Dheri	1700×1200 ft.	518.16×365.50 m.	189070 or 200000	(<i>Dani</i> , 1971, p. 28)
Harappa	same size as Mohenjo-Daro ³		850000	(<i>Wheeler</i> , 1968, p. 26)
Vainiwal	1000×800 ft.	304.8×243.84 m.	73872 or 75000	(<i>Pakistan Archaeology</i> , 1967, p. 7)
Ahmad Khan Dheri	750×300 ft.	228.6×91.44 m.	20748 or 20000	(<i>Mughal</i> , 1970, p. 158)
Dewalina Ther	1800×1290 ft.	548.14×393.192 m.	215364 or 222000	(<i>Mughal</i> , 1970, p. 158)
Lurewala	4200×2100 ft.	1280.16×640.08 m.	819200 or 820000	(<i>Mughal</i> , 1970, p. 159)
Trekoe	3750×1200 ft.	1143×365.76 m.	417195 or 420000	(<i>Mughal</i> , 1970, p. 160)
Qadarwali Ther	960×600 ft.	292.608×182.88 m.	53144 or 55000	(<i>Mughal</i> , 1970, p. 159)
Sandhanwala Ther	960×600 ft.	292.608×182.88 m.	53144 or 55000	(<i>Mughal</i> , 1970, p. 159)
Kalibangan	$920 \times 500 +$ 1150×820 ft.	280.41×152.4 $+ 350.52 \times 279.456$ m.	140210 or 150000	<i>Lal and Thapar</i> , 1967, p. 79)
Lothal	850×600 ft.	259.08×182.88 m.	46938 or 47500	(<i>Site Plan</i>)
Kanjetar	500×500 ft.	152.4×152.4 m.	23104 or 20000	(<i>Rao</i> , 1963, p. 181)

Kindarkhera	300×300 ft.	91.44×91.44 m.	8281 or 10000	(Rao, 1963, p. 183)
Devaliyo	2640×1300 ft.	804.672×396.24 m.	318384 or 320000	(Rao, 1963, p. 184)
Bhimpatal	400×300 ft.	121.92×91.44 m.	11011 or 10000	(Rao, 1963, p. 185)
Akru	1320×330 ft.	402.336×100.584 m.	40200 or 40000	(Rao, 1963, p. 186)
Malva	$\sim /$	201.1×91 m.	18291 or 20000	(Indian Archaeology— a Review, 1967-68, p. 10)
Surkotada		130×200 m.	26000	(Joshi, 1966, p. 64)
Kotadi		100-150 -500-250 m	140000	(Joshi, 1972, p. 108)

1. Only the round numbers have been used for multiplication.
2. Ali Murad has two mounds. Only the size of the larger mound has been mentioned in the report.
3. According to Mackay 1935 p. 61 Harappa is larger than Mohenjo-Daro. This is not mentioned by anybody else. In this context it may be noted that H. J. Plenderleith 1956, p. 26 mentioned that the size of Mohenjo-Daro was twice the generally supposed area. It has not been possible to check this statement either.

900,000 SQUARE METRES

A histogram illustrating the distribution of Harappan settlements based on their size in square metres. The vertical axis represents the size in square metres, with major tick marks at 0, 500,000, and 900,000. The horizontal axis lists 25 settlement names, each corresponding to a vertical bar representing its size. The bars show a wide range of sizes, with some settlements like Mohenjo-Daro and Harappa being significantly larger than others.

Settlement	Approximate Size (Square Metres)
Mohenjo-Daro	~800,000
Ali Murad	~600,000
Chanhur-Daro	~500,000
Karchhat	~450,000
Lohunjo-Daro	~400,000
Nokjo Shadinzai	~350,000
Mehi	~300,000
Pandi Wahi	~280,000
Thano Bula Khan	~250,000
Kotasur	~200,000
Naru Waro Dharo	~180,000
Theri Bahadur Shah	~150,000
Judeirto-Daro	~120,000
Kot Diji	~100,000
Sutkagendor	~80,000
Dabarkot	~70,000
Rahman Dheri	~60,000
Harappa	~55,000
Vainiwal	~50,000
Ahmed Khan Dheri	~45,000
Dewalina Ther	~40,000
Lurewala	~35,000
Trekoe	~30,000
Qudarwali Ther	~25,000
Sandhan Wala Ther	~20,000
Kalibangan	~15,000
Lothal	~10,000
Kanjtar	~8,000
Kindarkhera	~5,000
Devaliyo	~3,000
Bhim Patal	~2,000
Akru	~1,500
Malvan	~1,000
Surkotada	~800
Kotadi	~600

HISTOGRAM SHOWING THE SIZE OF HARAPPAN
SETTLEMENTS IN SQUARE METRES

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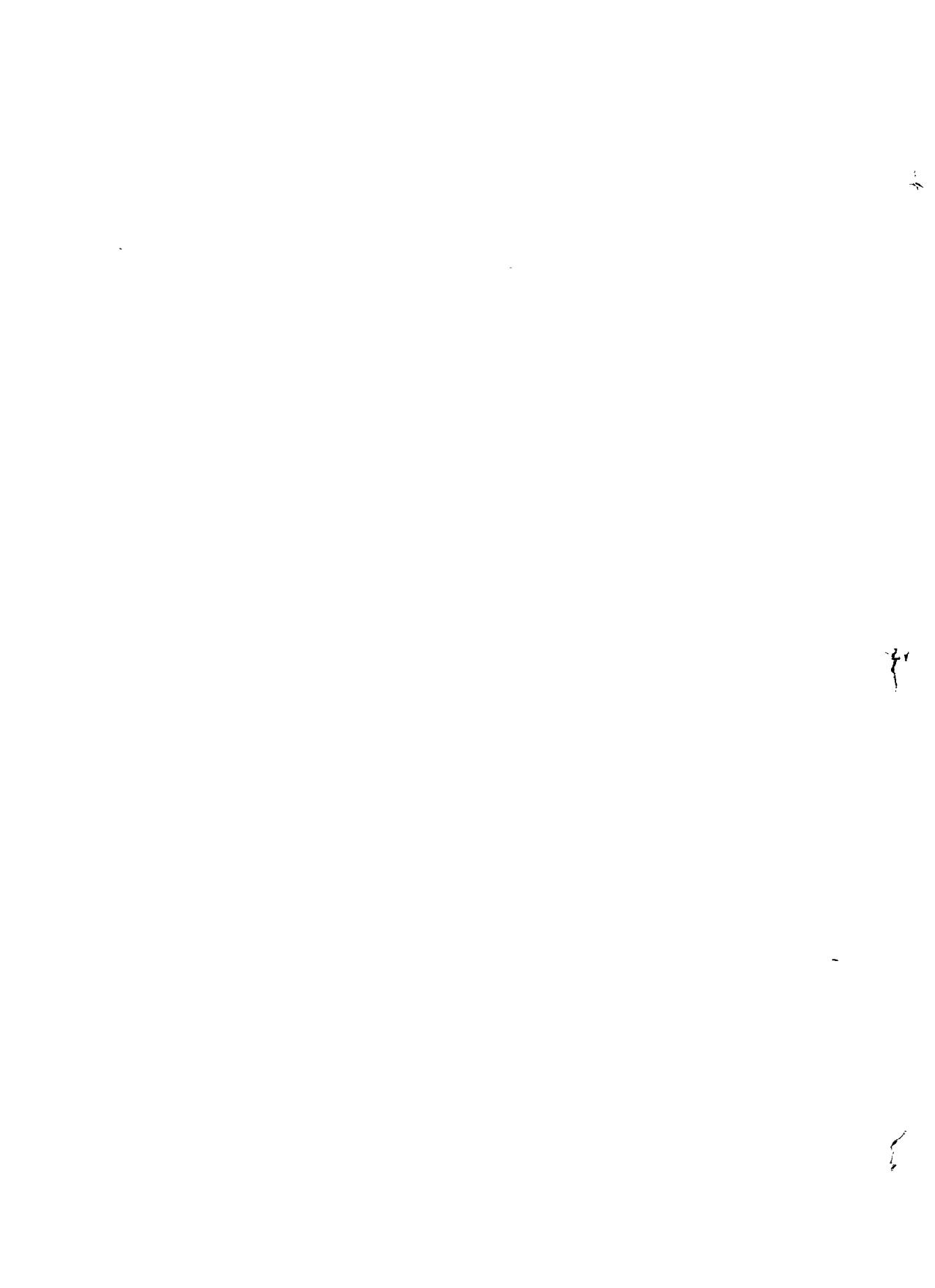
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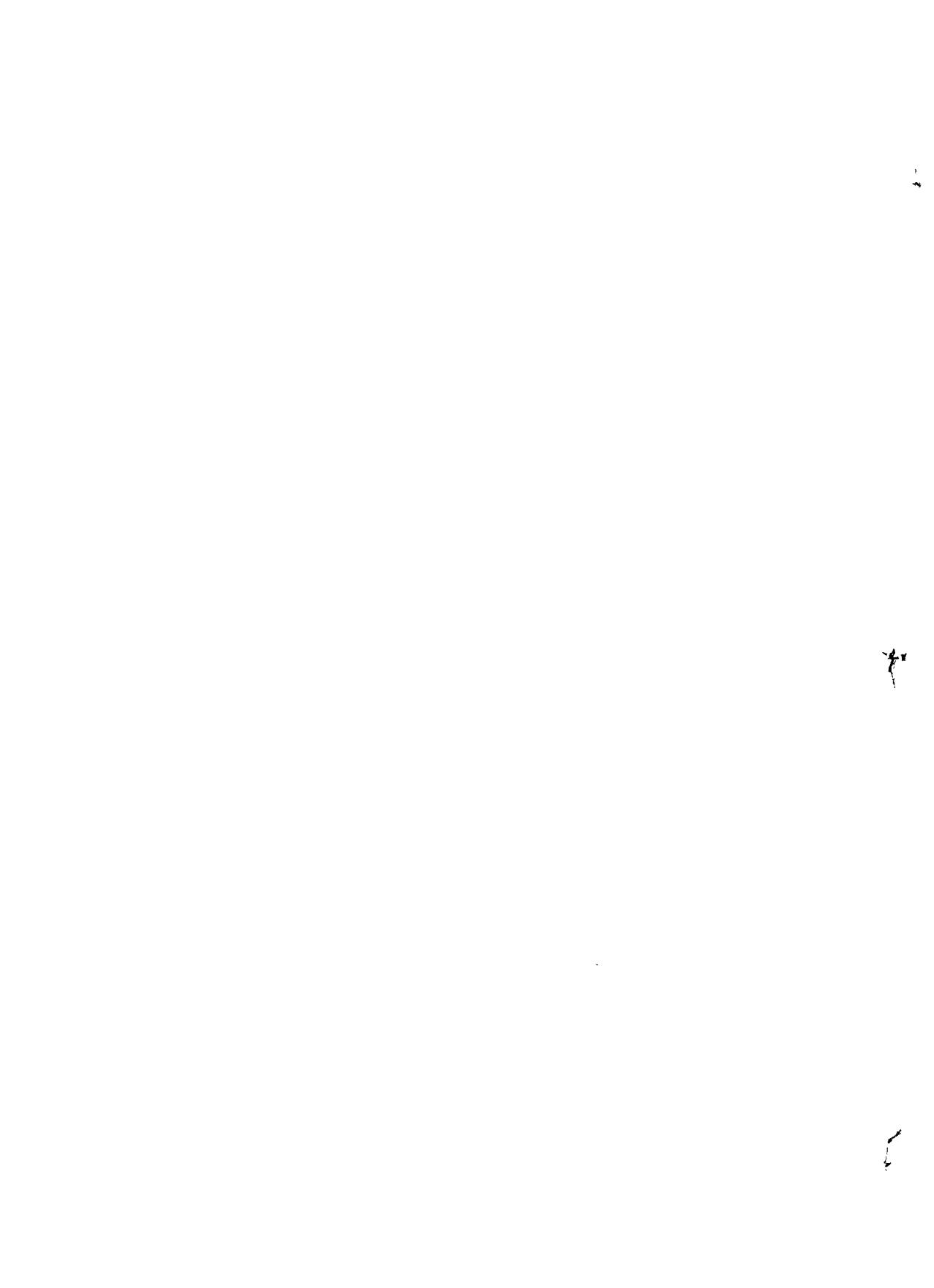
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THREE

NEOLITHIC—CHALCOLITHIC



The Neolithic Culture of Kashmir

I5

R. N. KAW

KASHMIR IS a saucer-shaped vale with a length of 134 km., a breadth of 38 km. at its broadest point and a mean height of 1800 m. above sea level, at about 34° latitude. It has a temperate climate and during winters the valley is covered with snow. Besides its magnificent woods, enchanting lakes, rivers and meadows and glorious snow clad mountains, it has a remarkable wealth of archaeological sites and monuments ranging from prehistoric times to the Moghul period.

The tradition says that Kashmir was once a lake known as *Sati-Saras*, the Lake of Sati. It is substantiated by the lacustrine deposits locally known as karewas, which are dotted all over the valley. Neolithic man settled on these karewas.

This first exploration in this area was carried out by de Terra and Paterson in 1935. They could not find any remains of the Palaeolithic man here but later on in 1969-70 Sankalia and a team from the Archaeological Survey of India, discovered the first palaeolithic tool from Kashmir. In fact Sankalia claims that these are the earliest palaeolithic remains in the whole of Asia (*Sankalia*, 1974, p. 33, 34).

Recent explorations by the Archaeological Survey of India have brought to light a number of similar site in the Kashmir valley e.g., Begagund, Gofkral, Hariparigom, Olchibag, Pampur, Panzgom, Sombur Waztal and Brah all in district Anantnag.

The discovery of Burzahom was first made by de Terra and Paterson during their expedition in 1935. They noticed menhirs at the site. A limited excavation near the menhirs was conducted by them which yielded some black polished ware with incised designs besides some bone and stone tools, the excavated remains were taken to be belonging to 'either a late or an early phase of the Indus Culture, (Pande, 1970, p. 25).

The systematic excavations at Burzahom were undertaken in 1960 by the Archaeological Survey of India under the direction of Shri T. N. Khazanchi and the results achieved were so rewarding that the work was continued till 1971.

The site of Burzahom (34° 10' N.Lat., 73° 54' E.Long, in District Srinagar is situated 16 km. north-east of Srinagar by the shortest route via Nasim and 24 km. via famous Shalimar Garden of Jahangir. The site is located on the ancient lake bed, locally called karewa, and commands a panoramic view of the lush green fields of the valley and the shimmering waters of the Dal Lake which is hardly 2 km. away.

With forests abounding in the hills around and with the lakes and the swampy areas lying at a stone's throw, the area is ideal for fishing, fowling and hunting, which is exactly what the earliest settlers did as shown by the excavations conducted at the site.

Burzahom in Kashmiri means the place of birch. That birch was available during neolithic times is proved by burnt birch found during the excavations at Burzahom (*IAR*, 1961-62, p. 17). The excavations have brought to light four cultural phases. Of these Periods I and II belong to the neolithic, Period III to the megalithic and Period IV to the early historical period (Post-megalithic).

Period I

The main feature of earliest settlers (Period I) was dwelling pits cut below ground level into the natural soil which is mostly loessic. The pits are well-like structures. The pits were dug out with long stone celts and traces of the cuts made are still visible. The pits are circular or oval in plan, narrow at the top and wide at the base (*Plate I*). The diameter varied according to the needs of the people. The largest of these pits measures 2.74 m. at the top 4.57 m. at the base and 3.95 m. in depth (*Khazanchi*, 1976, p. 26). The presence of post holes on the periphery suggests a birch cover supported on wooden posts as protection against the inclemencies of weather. As already stated above, burnt

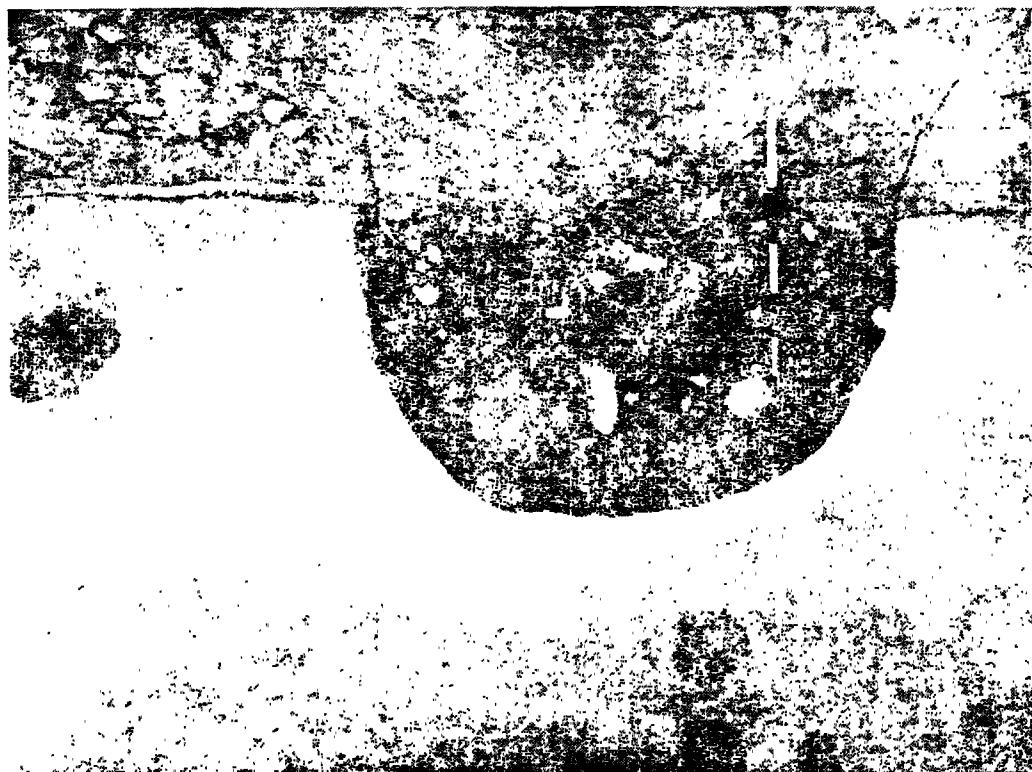


Plate I : Dwelling Pit of Period I with some post holes on the periphery.

birch has been found during the excavations. Though a few steps were provided in the deeper pits, these do not reach the bottom and probably would have narrowed down the living space and some other methods must have been used to reach the bottom. Descent into the smaller pits could be made directly from the ground level and as such no landing steps were provided. Presence of ash, charcoal and pot sherds within these pits clearly indicate human occupation. From the evidence of stone hearths near the mouths of some of these pits, it can be inferred that the settlers led also an open air life. Presence of shallow storage-pits, 60 to 91 cms. in diameter in close proximity also suggests that the pits dwellers used to shift to the ground level on sunny days or during summer months (*IAR*, 1961-62, p. 17).

The dwelling pits were thus the devices made by early neolithic man to fight the severe winters of Kashmir. Besides the circular pits, pit chambers which are rectangular or sometimes squarish have also been found (*Plate II*). These are also below the ground level and cut into the loessic deposits. The size of these square rectangular chambers varies. The recorded evidence of size of one of the rectangular chamber is 6.40×7.00 m. (*IAR*, 1966-67, p. 17). These chambers were also cut into the ground level upto a depth of roughly one metre. Some of these pit chambers had depressions on all the four sides, deep post holes on the four corners for the superstructure to cover the chambers perhaps with a sloping roof, storage pits and hearths in the centre. Some of the chambers had stone hearths while the others had clay hearths, which clearly indicates human occupation.

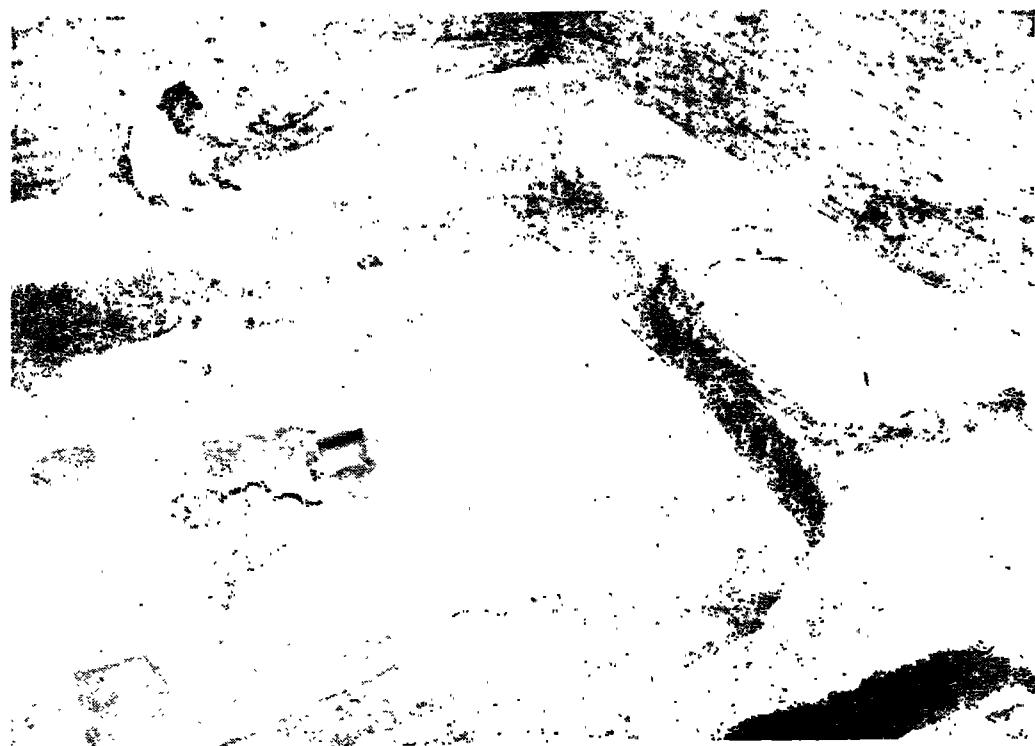


Plate II : Square Chamber with Stone hearth in the centre and post holes Period I.

Both circular dwelling pits and pit chambers were used for dwelling purposes. It is rather interesting that the pit chambers abound in the central portion of the mound and the dwelling circular pits are mostly on the periphery. It is quite likely that pit chambers were preferred since more members could be accommodated and could be more comfortable for residential purposes.

The earliest settlers at the site used hand made earthen pots. Many types then in use continue to be used in the villages of Kashmir even now. The pottery is mostly crude hand made ware, the colour being chiefly steel grey, shades of dull red, brown and buff. They are coarse in fabric and finish and are represented by bowls, vases and stem. Mat impressions are a recurrent feature on many types especially on pots having a flat base which indicates that they were made on mats (*IAR*, 1961-62, p. 19). Wheel made pottery is however, absent in this period.

No evidence has come across during excavations regarding the disposal of the dead in Neolithic Period I. The total absence of any burials of this period may indicate that the people may have adopted some other practice for disposal of the dead (*Pand.*, 1970).

Apart from the unique structural sequences stated above, bone and stone tools are characteristic (*Plate III & IV*). Bone tools as an organised industry are most developed here. The types are prolific and the manufacturing techniques provide an interesting insight into the level of development. The main types are harpoons for fishing, needles with or without eyes and awls used probably for stitching skins, spear points, arrow heads and daggers for hunting game, scrapers for treating skins. Tools have also been fashioned out of antler horns. The main types in stone are axes, chisels, adzes, pounders, mace-heads, points and picks.

The absence of seeds from this period shows that there is no positive evidence for



Plate III : Bone tools of Neolithic Period.



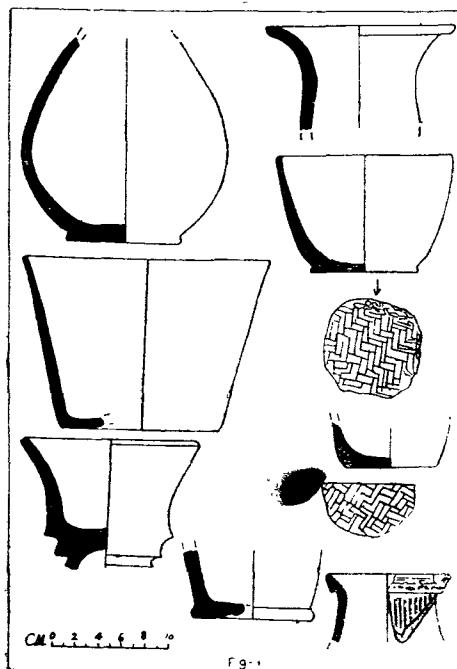
Plate IV : Stone tools of Neolithic Period.

cultivation of cereals but a stone quern has been found during excavations in one of the pit chambers of this period.

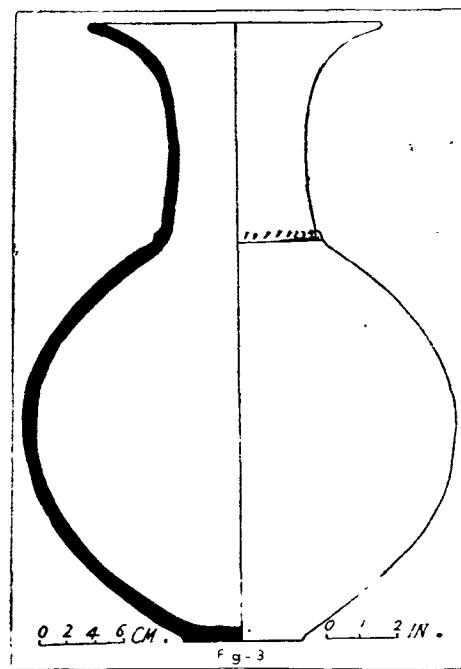
Period II

In the next stage are structures in mud or mud bricks with regular floors made of rammed karewa soil. Extensive timber structures are also indicated from the numerous post holes found at the site. These extensive structures suggest some sort of a community living. The subterranean pits and chambers used in the earlier period were no longer used. Some of these were filled up and plastered with mud and covered with a thin coat of red ochre to serve as a floor. The use of red-ochre during this period was noticed in a major portion of the site excavated. Superimposition of floors has also been noticed in this period. In one of the trenches, as many as forty-five well arranged post-holes were noticed, covering an area of 3.96 m. x 1.21 m. (*IAR, 1961-62, p. 19*). Associated with another floor was a hearth and an oval pit with a mean diameter of 1.04 m. A few mud platforms were also found with partitions walls on them. A few copper arrowheads were, however, found in Pd. II which may have been due to commercial contacts.

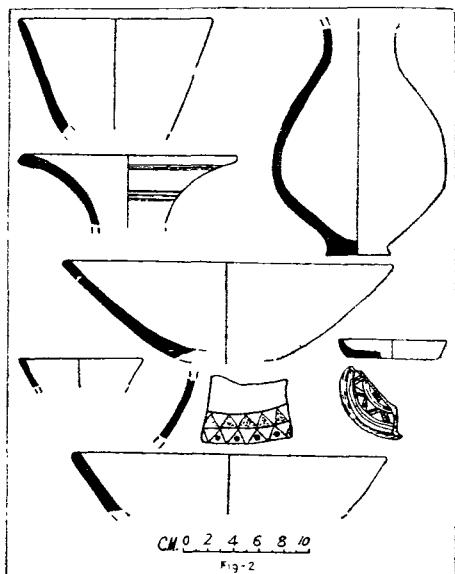
Pottery is generally hand made. A burnished black ware of medium fabric made its appearance in this period. It included such shapes as the dish with a hollow stand, globular pot, jar, stem with triangular perforations and a funnel-shaped vase (Fig. 1 & 2). A distinctive type in the black burnished ware was a high necked jar with a flaring rim, globular body and flat base. On the lower part of the neck were incised oblique notches (Fig. 3). The deluxe ware of the period is the black burnished warc. There were, however, a few painted pots which may have been imported. Towards the close of the neolithic levels a wheel made red ware pot with contained 950 beads was found. The beads are



Pottery shapes from Period I & II



High Necked Jar in Black Burnished ware
Period II.



Black Burnished ware, Period I & II



Red ware Pot with horned design Period II

ore of agate and carnelian and show an excellent workmanship. A red ware wheel made painted pot with horned figure from the early levels of Period II has also been found (Fig. 4).

This period indicates peculiar burials, which were found mostly within the settlement (*Plates V & VI*). Human beings were buried in oval pits, mostly dug into the house floors or in the compounds with the inner side of the pits plastered with lime. A noteworthy feature of the human burials of this period was the use of red ochre on the bones. Four of the human skeletons found were buried in a crouching position. The burials showed both primary and secondary interments, the former containing extended articulated skeletons and the latter only selected bones. Excepting in a few cases, no grave furniture was noticed. On the other hand whole animals or their bones were sometimes deposited with the human skeletal material. Evidence of trepanning showing seven finished and four unfinished circular wholes on the skull was present in one of the burials. The animals represented in the burials are dog, wolf, and ibex. The most interesting amongst these was a burial showing skeletal remains belonging to five wild dogs and antler's horn. It appears that pet animals particularly dogs, were sacrificed and buried along with the human body (*JAR, 1962-43, p. 9-10*).

The objects both in stone and bone of this period are similar to those of the earlier one but are more in number and better finished. Interesting are the rectangular harvesters with a curved cutting edge and two or more holes on either side and double edged picks in stone and long sized needles with or without eye in bone. However, a unique composite tool has been found in this Period. It is a borer on a long hollow bone like the cobbler's poker.

Period III

The neolithic period is followed by Megalithic culture associated with the erection of massive stones or menhirs, most probably commemorative. The material culture of the megalithic people is characterised by the use of a gritty red ware pottery. Bone and stone tools continue to be in use but the incidence is pretty less. The only marked difference is the use of wheel-made pottery. A few metallic objects have also been found. Besides the menhirs, rubble structures have also been found.



Plate V: Human Burial of Period II



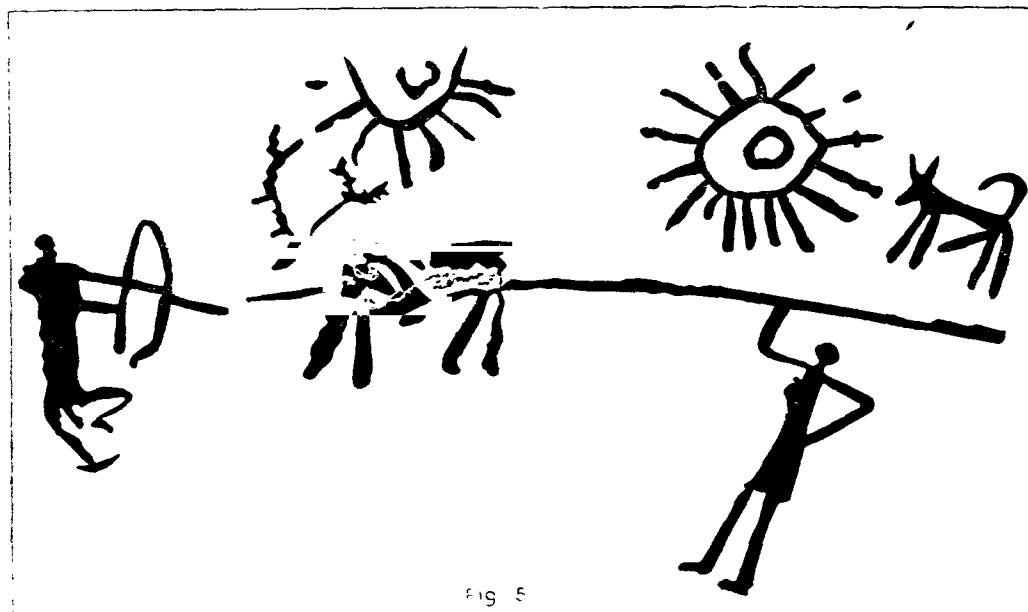
Plate VI: Skeleton of wild dog, Period II

Period IV

The last activity at the site is early historical period and it can be dated a little earlier than the Buddhist site of Harwan ascribable to the 3rd-4th century A.D. Mud brick structures have been found. The pottery was predominantly a wheel made red ware. A few metallic objects have been found.

Neolithic Art

The earliest attempt at art in the neolithic period is evidenced in Period II by the discovery of an engraved stone slab found, fixed in a rectangular structure forming some sort of a tank. The engraved face was placed upside down, making it non-functional in the place in which it has been found. The stone slab (base width 70 cm.) is flat on both faces the engraved side being smooth compared to the un-engraved one. Towards the



Hunting Scene on Stone Slab Period II

top it is partially damaged, as a result the uppermost part of the scene is slightly lost. However, the break is not a fresh one (*Pande, 1973, pp. 134-36*). The engraving depicts a hunting scene showing an antler being pierced from behind with a long spear by a hunter and an arrow being discharged by another hunter from the front (Fig. 5). The topmost portion shows two suns and a dog. Showing two suns may probably have some symbolic value and perhaps may indicate hunting in day light. If the presumption is correct then one sun may be depicting the rising sun and another the setting sun. Another stone slab showing an incomplete pattern has also been found from the same structure. Pande (1972, pp. 175-177) has tried to identify a hut and the hind portion of an animal in this highly stylised and abstract tectiform.

Chronology

Following are some of the select list of radiocarbon dates from the neolithic levels of Burzahom based on half life value of 5730 years.

TF-15	1535 ± 110 B.C.
TF-129	1825 ± 100 B.C.
TF-13	1850 ± 125 B.C.
TF-14	2025 ± 350 B.C.
TF-127	2100 ± 115 B.C.
TF-123	2225 ± 115 B.C.
TF-128	2375 ± 210 B.C.

Conclusions

The neolithic culture of Kashmir Valley has its own distinctive traits not shared by its counterparts from elsewhere in India. Its wide range of bone and stone tools, dwelling pits, perforated knife or blade, burials of animals with human skeletons and purposeful burial of only animals mark it as something unique. Dwelling pits, application of red ochre on the dead, burials of animals with their masters, perforated knives of stone or harvester and the characteristic bone tools link the neolithic of Kashmir with north China, Central Asia, some sites in Russia, as also in Afghanistan and Iran.

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*Early Farming Cultures
of Central India*

16

M. K. DHAVALIKAR

THE DISCOVERY of the post-Harappan chalcolithic cultures in Central India and the Deccan doubtless constitutes a landmark in Indian archaeology. The large scale excavations by Professor H. D. Sankalia and his colleagues at Maheshwar and Navdatoli in the fifties opened a new chapter in the protohistory of Central India and subsequent excavations at Nagda, Eran, Kayatha and other sites have pushed back the antiquity of settled life in this part of the country to the opening of the second millennium B. C. Explorations, more particularly those by Dr. V. S. Wakankar of Vikram University, Ujjain have brought to light a large number of settlements of the early farmers of Central India. It should, however, be stressed in this connection that much of the work is as yet limited to the western part of the present state of Madhya Pradesh which is commonly known as Malwa and no significant work has so far been done in other parts of Central India. Our picture of the early farming cultures of Central India, therefore, has, of necessity, to be rather incomplete. Only intensive exploration in other regions will fill up the lacunae in our knowledge.

Environment

The Malwa region ($27^{\circ}70' - 25^{\circ}10'$ North and $73^{\circ}45' - 79^{\circ}14'$ East) forms a distinct geographical unit on the basis of physiography as also economically and culturally. Lying almost in the heart of India, it forms the link between the Indo-Gangetic plain and the peninsular region. The region itself forms a part of the northernmost tip of the peninsula. Its geology is complex and almost all the peninsular groups are represented here. It is drained by two systems, the Narmada, Tapti and Mahi which join the Arabian sea and Chambal and Betwa joining the Yamuna. The climate is generally of the tropical monsoon type. It is generally healthy and the nights are usually cool on the Malwa plateau. The average rainfall is about 106 cm. The black soil, which occupies almost entire Malwa, is known for its fertility. It is, however, much deeper in the Narmada valley. Very probably the earliest settlers of Malwa, the authors of the chalcolithic cultures, were attracted to this region because of its fertility and even in the historical period, Malwa was a bone of contention among the rival princely houses.

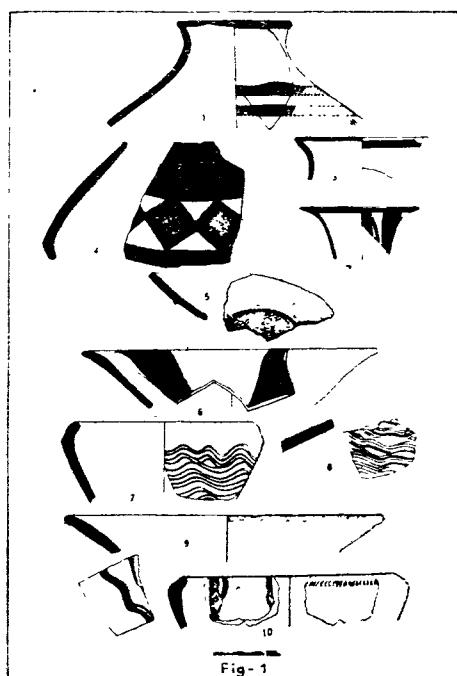
Kayatha culture

It was thus far held that the Malwa culture, which was well defined by the excavations at Maheshwar and Navdatoli, was the earliest that flourished in Central India, but the evidence from the excavations at Kayatha has stretched back the beginning of settled life in Central India to C. 2000 B.C. The ancient site of Kayatha (Distt. Ujjain, M. P.) was excavated by Wakankar in 1965 and 1966 under the auspices of the Vikram University (*Wakankar, 1967*). It was also excavated by the writer and Z. D. Ansari of the Deccan College Post-Graduate Research Institute, Pune in collaboration with Wakankar in 1968 (*Ansari & Dhavalikar, 1975*).

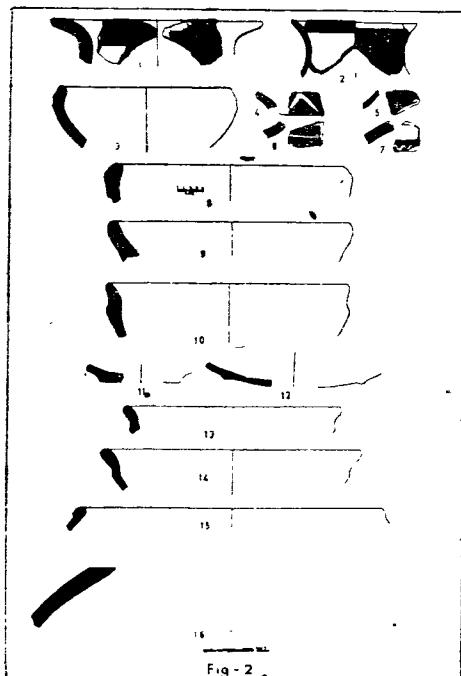
Kayatha can be identified with the ancient Kapithaka which was the birth place of the celebrated Indian astronomer, Varahamihira, who was born as a gift of the Sun god to his father, Adityadasa. There was probably a sixth century sun temple at Kayatha for Wakankar discovered a fine sun image of this period at the ancient site. The site is located on the right bank of the Choti Kali Sind, a tributary of Kali Sind, which in its turn is a tributary of the Chambal.

The earliest farming culture at the site has been named after Kayatha, where it was first identified. It can be dated, on the basis of radiocarbon determinations, to C. 2000-1800 B.C. The culture is characterised by three distinct ceramic industries which have no parallels in the country. Of these, the principal ware is a fine sturdy pottery which is dressed with a thick brown slip, usually from lip to shoulder and sometimes extending upto the base (*Fig. 1*) and the patterns were executed over it in violet or deep red. The designs are linear and appear only on the upper half of the vessel, particularly on the rim. The shapes include bowls and basins, vases with globular profile and concave neck, and storage jars. A majority of the vessels in this ware have been provided with a ring base which, however, appears functionally ineffective as the base in several cases is seen bulging below the ring. We do not know if the ring base was provided with a view to accommodating the vessel on some sort of stand. There are also few vessels with a disc base. This pottery is made of extremely fine, pinkish paste of well levigated clay which is free from grit or impurities of any sort. The uniform striation marks on the interior of the vessels show that they were wheel-thrown. The ceramic bears some resemblance with the dark slipped ware from Sothi in Rajasthan so far as its fabric and the surface treatment is concerned. Some shapes—the deep bowl with beaded rim and the globular jar—too are common to both wares. The similarity between the two ceramics, however, cannot be stretched too far; it is nonetheless significant and indicative of some pre-Harappan element in the Kayatha culture, for the Sothi culture is now classe as pre-Harappan (*Ghosh, 1965, p. 115*). Some Harappan element are also discernible in the Kayatha ware. In this connection mention should be made of some Harappan vessels which are treated allover with a dark chocolate slip (*Mackay, 1943, pp. 67 & 85; Pl. XXXV, 2*); but they do not, however, bear paintings in red as is the case with the Kayatha ware. A few sherds painted with a broad zone on the neck have been reported from the earliest occupational phase at Prakash, a chalcolithic site in the Tapti valley; they are skin to those in the Kayatha ware. But the precise nature of this cultural give-and-take has not yet been ascertained.

Another important ceramic of the Kayatha culture is the Buff-painted ware (*Fig. 2*). It is thin walled and of extremely fine fabric. The vessels of this ware have a buff



Kayatha Ware

Kayathared painted buff ware
and combed ware

surface because of the wash of that colour over which painted patterns are executed in red pigment. The painted designs are linear and geometric such as sets of oblique lines, festoons and loops and latticed diamonds. The painted ornament is in light red and one often enough comes across patterns which were done in more than one stroke. The paint, therefore, has the tendency to 'run on'. For preparing this red colour, the potter seems to have used haematite, chunks of which have been found at the site and a few have come from the excavated trenches as well. The range of shapes in this ware is limited. The commonest is the typical Indian *lota*, a small water vessel with flaring mouth, round bulbous bottom and a carinated body. Besides, there are high and short concave necked jars and basins. The ware bears a striking resemblance to the thin walled variety of the Malwa ware which has been labelled as the 'Eran Fabric' (*Dhavalikar, 1970-71, p. 25*). Particularly noteworthy is the *lota* which is common to both the wares. One therefore wonders whether the red painted buff ware of Kayatha is the source of the later Malwa ware.

Another characteristic ware of the Kayatha culture is what can be described as the Combed Ware (Fig. 2). It is a red pottery of fine fabric, usually without slip or wash of any kind, but it is decorated with incised patterns such as multiple zigzags, chevrons etc. They have undoubtedly been executed with a comblike instrument. Only bowls and basins are represented in this ware. Some of the vessels are painted with a broad zone in red. Pottery bearing similar incised patterns on the vessels have been reported from Sothi in Rajasthan. The latter, however, bears deep incisions whereas the Kayatha Combed Ware is characterised by superficial incisions. But one sherd, exactly identical with the Kayatha Combed Ware, has been noticed in the Sothi pottery.

Nothing can be said definitely about the food habits of the people of the Kayatha culture as no remains of grains have been found. But that they domesticated cattle is evident from animal bones, mostly of bovine species. Besides this, they also included tortoise in their diet. Surprisingly enough, they also had domesticated horse (*Alur in Ansari & Dhavalikar, 1975, pp. 159-60*).

Since the excavations at Kayatha were restricted, no complete house plans have been recovered and nothing can therefore be said about the houses of the people. But the yield of minor artifacts was quite rich and we therefore know more about the material culture of the authors of the Kayatha culture. Their tool outfit was chalcolithic in character, for they used both copper and stone tools. The tools of copper were doubtless scarce for the metal was not easily available in desired quantities. The people, however, had mastered the technology of copper as is evidenced by the find of two fine copper axes (*Pl. I*). They have a sharp cutting edge and a lenticular section; the other edge has been hammered and thickened obviously for making it convenient for hafting. But their most noteworthy feature is that they have been cast in moulds in sharp contrast to the similar artifacts of the later chalcolithic cultures of Central Indian and the Deccan which were just hammered into the desired shape after heating the metal. The moulds for the Kayatha axes may have been of terracotta but the possibility of stone moulds can not be ruled out. A fragmentary chisel is also reported from Kayatha. But far more interesting is the discovery of twenty eight copper bangles which were found deposited in two red painted buff ware pots, fifteen in one and thirteen in another (*Pl. II*). The bangles are round and solid in section and have featureless terminals. The



Plate I : Kayatha Copper axes

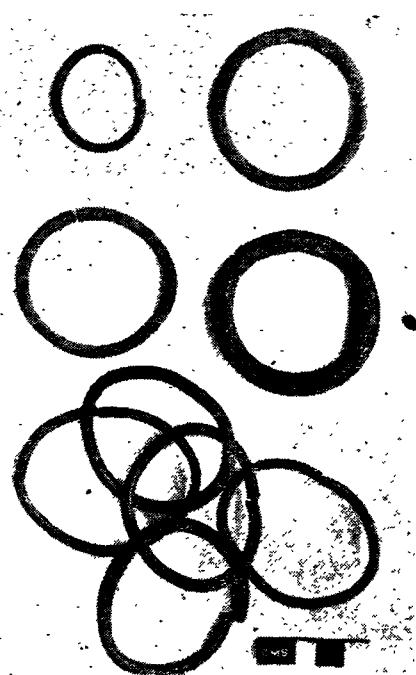


Plate II : Kayatha Copper bangles

only conclusion that we can draw from this rich cache of copper objects is that the metal was not too scarce as is usually thought. This naturally leads us to the problem of the availability of ore. We do not know whether native copper was available in the river beds or whether it was extracted from chalcopyrites as was probably the case with the chalcolithic cultures of the Deccan. It is, however, certain that the people of the Kayatha culture had already mastered the copper technology before their arrival at the site.

Associated with the copper tools was a specialised blade flake industry. The stone used is mostly silicious such as the fine grained chalcedony, nodules of which are available in the form of veins in the rocks in surrounding areas. A close examination of the fluted cores shows that the nodule was dressed into desired shape and blades were then produced on a large scale by the punch technique. The tool types comprise parallel-sided blades, pen-knife blades, points, lunates with blunted back etc. This industry is later found in all other chalcolithic cultures of Central India and the Deccan. Another stone artifact is a mace head or ring stone which was perhaps used as an agricultural implement for turning soil.

Of the personal ornaments, reference has already been made to copper bangles. But more interesting are two exquisite necklaces, composed respectively of 173 and 160 beads of semi precious stones which were found deposited in two red painted buff ware pots (*pl. III*). They at once recall to mind the one from Mohenjo-daro (*Marshall, 1931; Pl. CXLVIII, 6*). The beads are mostly long barrels, short bicones and oblates and are made of carnelian and agate while a faceted crystal is also present. Also noteworthy is the discovery of a pot containing over 40,000 micro-beads of steatite. They were all strung in thread and a number of necklaces thus made were kept in a red painted buff ware pot similar to those in which other necklaces and copper bangles were found.

All the objects described above — the copper axes, bangles, and necklaces — were found in a small area, obviously a part of the house which, however, was not found. The circumstances of their discovery suggest that the occupants of the house — and incidentally the people of the Kayatha culture — had to leave the settlement all of a sudden or else they would not have left their valuables on the house floor. It is betoken of the calamity that befell the people of the Kayatha culture — a calamity so sudden and unexpected and at the same time of unimaginable magnitude that the only course left open to them was to flee for life, leaving all their earthly possessions. This also explains the abrupt break in the occupation of the site. This may have happened around 1800 B.C. The site remained unoccupied for a century or less and this hiatus is stratigraphically represented by a compact sterile layer about 15 cm. thick. It was not a natural calamity such as flood or tectonic movement which forced the people to desert the site; it may have been an invasion by a neighbouring tribe. But whosoever, the enemy may have been, he seems to have only destroyed the Kayatha people and left. The conquerors did not settle at the site for there is clear evidence showing that the site remained unoccupied for a certain period of time only to be occupied again around 1700 B.C. by the people of the Banas or the Ahar culture from the neighbouring region of southeast Rajasthan.

No human skeletal remains have been found and we cannot therefore say anything about the authors of the Kayatha culture. The origin of the culture is also obscure because the culture, before its arrival at Kayatha, appears to be fully developed. The affinities between the Kayatha ceramic industries with that of the pre-Harappan Sothi culture would

suggest that it was a pre-Harappan culture already developed and flourishing somewhere in the northwestern parts of the sub-continent. The people of this culture appear to have been pushed out from their original habitat by the urbanized Harappans and they therefore had of necessity to migrate to new lands. They may have thus reached the Chambal valley in Malwa. Did they name the river Kali Sind on whose banks they settled in reviving the memory of their motherland which was lost to them? Although this is hypothetical, the very make-up of the Kayatha culture — the superior pottery, the advanced metal technology, the sophisticated ornaments—all suggest that it is akin to the Pre-Harappan with some Harappan elements in it. There is every likelihood of the Kayatha people being settled earlier in the Bikaner desert region of Rajasthan where Pre-Harappan settlements have been discovered and Malwa was not far off from there through southeast Rajasthan. Recent explorations by Wakankar show that the Kayatha culture was spread in the Chambal valley.

Ahar culture

The Ahar or the Banasian culture flourished in the Banas valley in southeast Rajasthan and has been well defined because of the large scale excavations at Ahar near Udaipur (*Sankalia, Dho & Ansari, 1969*). At Navdatoli on the Narmada the elements of the Ahar culture were found mixed with those of the Malwa culture, and it was for the first time that the distinct existence of this culture in Central India was noticed at Kayatha. But in Central India, the culture appears to have been confined to the Chambal valley. It is characterised by the use of a ceramic industry known as the black-and-red ware, painted in white usually on the exterior but occasionally also on the interior of the vessels. The pottery is wheel-made and is coarse in fabric. The commonest forms in this ware are a variety of bowls and dishes and the painted patterns are mostly geometric, comprising groups of parallel lines, vertical and oblique, and circles. The spiral is also met with, though rarely. An interesting feature of this pottery, which has been noticed at Kayatha, is that the bowls usually have thin incised lines or grooves on the neck. Though this feature has already been noticed at Ahar (*IAR 1961-62, p. 47 ; Fig. 17, 4*), it becomes a diagnostic trait at Kayatha.

Another important ceramic of this period is 'red slipped ware', including such variants as tan, orange, chocolate and brown slipped pottery, all highly burnished. A noteworthy shape in this ware is a vase with sloping, corrugated shoulders, broad or high cylindrical neck with corrugation, and possibly a pedestalled base. Associated with this are handmade coarse red and grey wares which take the form of huge storage jars and troughs and basins, bearing incised and applique designs.

The Ahar culture, as revealed by the excavations at Ahar, has been found to be a purely copper-using culture (*IAR, 1961-62, p. 50*). At Gilund, however, a few microliths were found associated with this culture (*IAR, 1959-60, p. 41*). But at Kayatha, a full-fledged blade industry characterises the Ahar culture and it has therefore to be taken as a new element of this culture. It may, however, be a special feature due to the absence of suitable copper ores in the surrounding region, the people of necessity starting the production of lithic blades on a massive scale in order to adapt themselves to the new environment.

The houses of this period appear to have been modest. They were humble structures of mud and the impressions found on wall fragments suggest that the walls were made

of reed screens, thickly plastered with mud. The house floors in some cases were made of a bedding of gravel and cobble, rammed in hard compact yellow clay. The people used necklaces of shell beads of a short cylindrical shape. Mention should also be made of a short biconic terracotta bead bearing punctured patterns identical with those on beads from Ahar. The latter, as has been shown by Sankalia (1963 : 330, fig. 24a) have parallels in western Asia. At Kayatha there was evidence of large-scale burning at this level, probably responsible for the decline of culture.

A new element of this culture, which was brought to light by the Kayatha excavations, is the terracotta art of the people. Only a few terracotta figurines, mostly in the shape of bulls and occasionally a ram, have been reported from sites in the nuclear region of the Ahar culture. But at Kayatha, a large number of terracotta figurines of a singularly unique variety have been found in the Ahar levels (*Pl. IV*). It is rather strange that

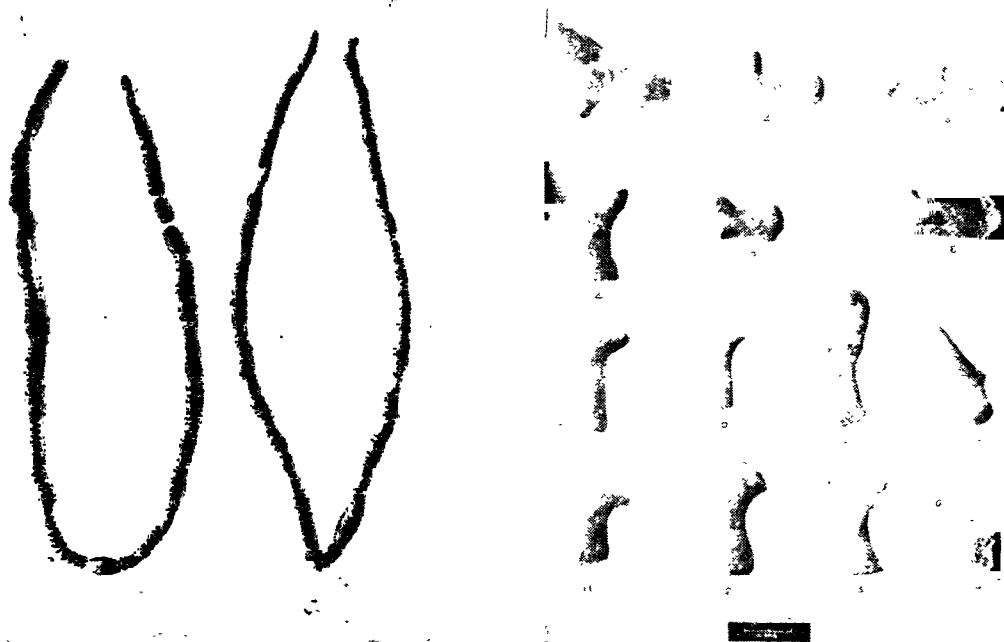


Plate III: Kayatha-Necklace beads

Plate IV: Kayatha-Terracotta bull figurines

such figurines should be absent in the original home of the Ahar culture, but should occur in its peripheral zone. The terracottas comprise only animal figures among which the most predominant are bulls. They are divisible into two distinct categories on stylistic grounds : naturalistic and stylized. Both are made of extremely fine clay, free from impurities of any sort and are baked at a uniformly high temperature. No figurine is treated with slip of any kind, nor is there any attempt at ornamentation. The only decoration, if one can call it that, consists of nail marks over the body of the animals (*Pl. IV, 2*). This, though somewhat rare, recalls similar treatment on some of the Harappan terracottas (Mackay, 1938, *Pl. LXXX, 12*). On several specimens may also be seen the finger impressions of the hands that fashioned them. Delicate modelling is evidenced in the

long pointed horns; the hump is most prominent and the mouth pinched, while the block legs remind us of similar treatment of protohistoric bull figurines from other parts of the country.

Of the naturalistic rendering there is nothing that is especially noteworthy; it is the stylized forms of bulls which deserve special attention. There are several varieties of these stylized forms. In a majority of cases the head with horns and the conspicuous hump are present, but the whole hind part is absent; in its place we see a stem with a rounded end (*Pl. IV, 1-6*). Sometimes the end is flat and thus serves as a pedestalled base, probably for keeping the figurine on a platform during ritual (*Pl. IV, 7-9*). The degree of stylization reaches a new mark in the form that depicts a pair of short horns on a stem or pedestal (*Pl. IV, 11-14*). Such horns at once remind us of the Minoans in whose palace at Knossos there are several representations of pair of horns. But it is no more than a chance resemblance and beyond this no relationship can be hazarded.

The naturalistic and the stylized bull figurines are found together and, even among the latter, all the different varieties occur right from the beginning, thus precluding any attempt at tracing the evolution of different forms. The stylized bull forms are unique, having no parallels elsewhere in the country even later in the historical period, and they therefore remain an enigma. They have been found in considerable quantity and would seem therefore to have been used as votive offerings; they also might have been suspended round the neck on a thread as the Lingayats do today. The bull cult has a hoary antiquity, particularly in India where the beast is worshipped even today. Tradition dies hard, and in no place harder than in India.

Malwa culture

The succeeding farming culture that flourished in Malwa in Central India has been named as the Malwa culture. The region was justly famous in the ancient past as it is now for its fertile soil. Its chequered history bears eloquent testimony to its prosperity because time and again battles were fought for the supremacy over Malwa. It is therefore in the fitness of things that it should have attracted the early farmers of Central India whose settlements have been subjected to scientific excavation at Nagda, Navdatoli, Maheshwar, Eran, Mandasor etc. The Malwa culture is also represented at Kayatha where the authors of this culture, however, were not the first to settle.

The Malwa culture has been well defined by the large scale excavations at Navdatoli which is by the far the most extensive settlements of this culture. The site is situated on the southern bank of Narmada, and on the opposite bank at Maheshwar also the habitation of the Malwa culture has been excavated. The chalcolithic people seem to have selected this spot obviously because of the environment which must have been quite congenial to them. Sankalia aptly describes it: "Here the Narmada flows in a very broad valley having rich alluvial deposits on either sides of its banks. These were once forested but were almost suitable for agriculture. Secondly, here there is an ancient crossing from the north to south, documented both by early literary sources and now archaeology." (*Sankalia, 1974, p. 434*).

The extensive chalcolithic occupation at Navdatoli, which is represented by four mounds, may not have been so at the beginning of the occupation. The initial occupation begins, as the radiocarbon dates show, around 1600 B.C. or may be even slightly earlier,

and it continued till about 1300 B.C. when the site was deserted only to be occupied later in the Kushan period. On the basis of the study of pottery, the chalcolithic occupation is divisible into four distinct phases. Of these, the earliest is characterised by the white painted black-and-red ware belonging to the Banas or the Ahar culture of southeast Rajasthan. In the second phase occurs a cream slipped ware. Next comes a black-on-red painted pottery and in the final phase of occupation a coarse red ware occurs in association with the Lustrous Red ware which is characteristic of the post-Harappan culture of Gujarat. But during all these four phases of occupation the Malwa ware—the black-on-red painted pottery — occurs abundantly. It is this ceramic which enables us to identify the Malwa culture. But for the occurrence of these different wares, there is no difference in the material culture of the people of the Malwa culture.

At Navdatoli no traces of any rampart of defence wall have been found, but the chalcolithic settlement at Nagda was possibly fortified. A massive fortification wall and a moat have been discovered at Eran, an important settlement of the Malwa culture in eastern Malwa (Singh, 1962, pp. 41-44). At places it had a basal width of 30.48 m, and it was separated from the moat by 15.34 m. This gap was subsequently filled completely bringing the total width to 45.82 m. At the base the wall was 47 m. wide at places. The mud rampart is believed to have been constructed in the middle phase of the chalcolithic occupation for which the earliest radiocarbon date is 2035 ± 75 B.C. which is rather an isolated date (Agrawal, 1971, p. 99). However, doubts have been expressed regarding the chalcolithic date of the rampart. A. Ghosh observes : "The fortification continued to be in use in the next cultural period as well, dated 700 to 200 B.C. which saw iron, coins and other equipments of the early historical period. This would mean that Eran is remarkable in that at the chalcolithic stage it had a fortification which few other chalcolithic sites had and it is therefore eminently suitable for the study of the pastoral society transforming itself into a civilized one. Unfortunately the published notices fail to throw any significant light in this direction. It is impossible that a closer look at the stratification might reduce the life-span of the fortification, bringing it closer to the historical period." (Ghosh, 1973, p. 63).

The excavations at Navdatoli have brought to light excellent house plans of the people of the Malwa culture. The houses were no doubt modest; they were either circular or rectangular plan. The average diameter of a circular house was about 3 m while the rectangular house measured about 3.50 m. \times 2.50 m. The houses had wooden posts all round to support the roof which, in all probability, was conical. The walls, in some cases, were very low or totally absent: in the latter case mud was found to be plastered over screens of split bamboo. The posts were also usually of bamboo and, strangely enough, of conifer though rarely. There does not seem to be any planning of the settlement; the houses were built haphazardly. The use of mud bricks for construction has been attested at Nagda on the Chambal (IAR, 1955-56, p. 14; Pl. XXI).

Inside the houses, *chulahs* have been found. They are one or two mouthed with low walls which suggest that only small faggots could be used as fuel just as poor people use twigs and dried branches for their fuel. These single or double mouthed *chulahs*, according to Sankalia, indicate the economic and social status of the occupants (Sankalia, 1974, p. 438). Exactly identical *chulahs* have been reported from Eran as well (IAR, 1962-63, p. 11; 1964-65, p. 17). Storage jars have been found inside the houses. In one of the houses at Navdatoli storage jars have been found placed along the wall while in the centre of the

hut stood a pot kept on a rectangular terracotta stand bearing finger tip decoration. Although this house belonged to Phase IV of the chalcolithic occupation, stands of other shapes occur right from the earliest phase.

The pottery of the Malwa culture — labelled as the Malwa ware — is extremely rich in form and the painted ornament (Fig. 3). One must agree with Sankalia that "among all the painted pottery found in India so far, that at Navdatoli has given the largest repertory of designs" (*Sankalia, 1974, p. 457*). It is a buff or orange slipped ware which is decorated with designs in black or dark brown. The core, however, is somewhat coarse showing more of chopped husk which was added to the clay. The slip too is considerably thick. A thinner variety of the ceramic also occurs, but its percentage is much low at Navdatoli and other sites in western Malwa, whereas it becomes the predominant ware at Eran and has therefore been given the sobriquet, the 'Eran fabric'. (*Dhavalikar, 1970-71, p. 25*). But the forms and designs are common to both. The same holds good in the case of the grey ware which is reported from Eran as a distinct ceramic industry. This pottery is actually the Malwa ware but was obviously fired into a grey hue because of peculiar conditions in the kiln (*Dhavalikar, 1971, p. 25*).

The Malwa ware occurs at Malwa sites in great profusion, so much so, that at Navdatoli nearly three fourths of the pottery yield is the Malwa ware. The fossil forms in the ware comprise a water vessel, the typical Indian *lota*, with a wide flaring mouth, bulbous base and carination on the waist (Fig. 3). Several such *lotas*, bearing elegant painted designs, have been reported from Navdatoli. Another important shape is a bowl with concave sides, but with blunt carination. These are present in various sizes. For more interesting are the channel spouted cups and pedestalled goblets. The former appear to have been copied from a metal prototype which must be very similar to that from the Khurdi copper hoard in Rajasthan. The drinking goblets or rather chalices or champagne glasses, as some would prefer to call them, have turned up only from Navdatoli and not from other sites of the Malwa culture. This, according to Sankalia, is enigmatic, for if we postulate a foreign influence or contact, the route or routes by which it reached central India should be searched for. If a land route cannot or does not come up...then one might think of a sea or river route through Broach along Narbada." (*Sankalia, 1974, p. 459*). The channel spouted cup also, in the opinion of Sankalia, is of West Asiatic import (*Sankalia, 1963, p. 315-17*). Although parallels cited by him are no less convincing, the indigenous development from the pinched lip to the channel spout through the short channel cannot be ruled out.

The repertoire of painted motifs, as already noted, is considerably rich and varied. There are over six hundred motifs in all; they are primarily geometric but many exquisite naturalistic designs also occur. The geometric designs comprise linear patterns and triangles and lozenges, either vacant or solid or hatched. Among the naturalistic motifs are plants and animals and even human figures are painted on some pots (*Sankalia, 1955*). The excavator says that these exotic forms show Iranian or Western Asiatic contacts or influence (*Sankalia, 1963, p. 320*). Among the animals are black buck, bull, dog, deer, peacock, pig, tiger, panther, fox, tortoise, crocodile and three types of insects. The painted pattern, however, is confined to the upper part of vessels, and very rarely we come across a pot which is painted all over.

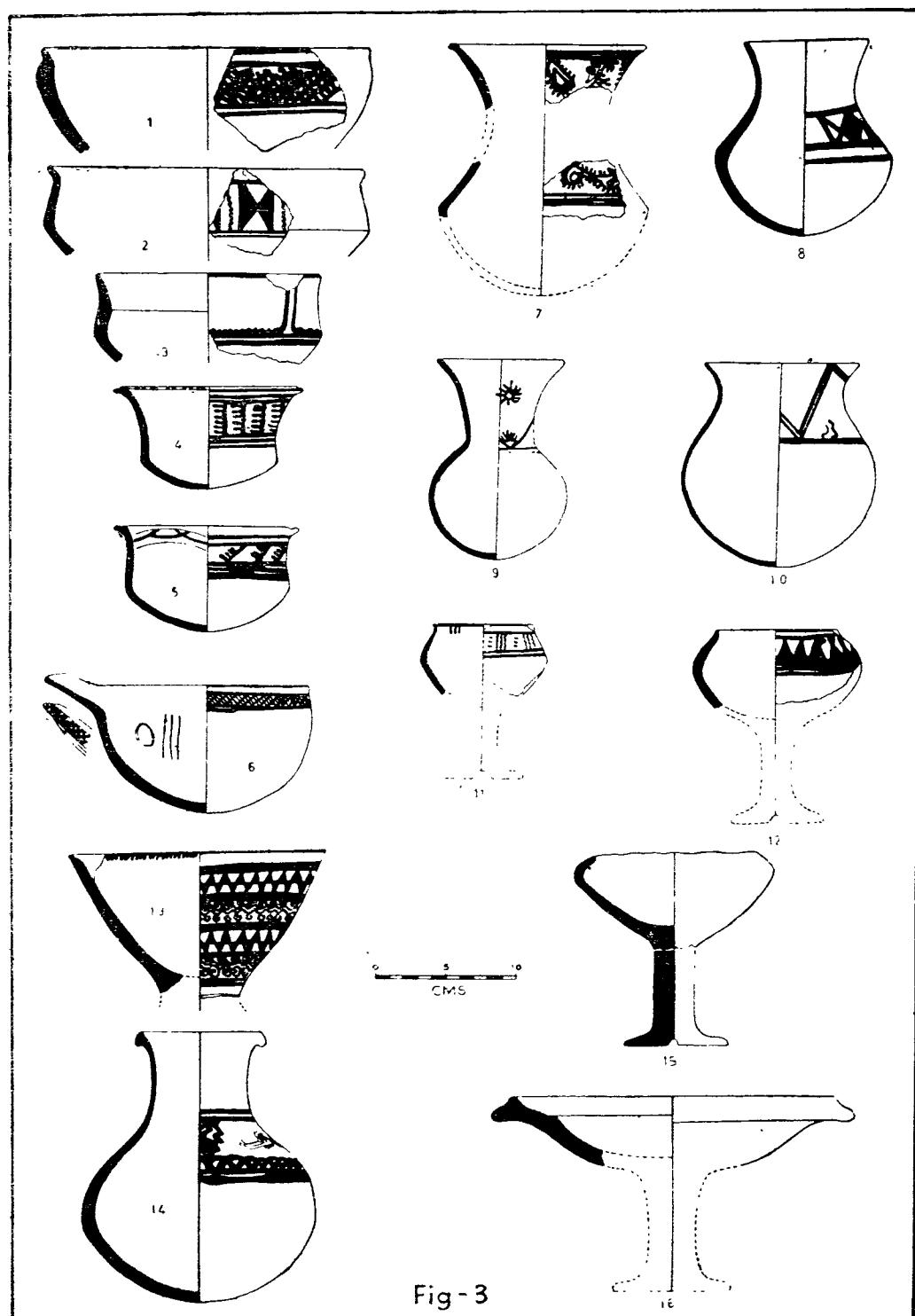


Fig.-3

Malwa ware

Subsistence

The people of the Malwa culture raised a large number of crops possibly in the alluvial tracts of Narmada and Chambal and their tributaries, but they might have also cultivated the rich black cotton soil for which Malwa is justly famous. The chalcolithic farmers might have used a wooden plough as some farmers do in parts of Madhya Pradesh where the wood of *Khair* (*Areca catechu*) is presently used. Among the cereals, of which charred grains have been recovered from the excavations at Navdatoli, the most important was wheat (*Triticum vulgare compactum*). Barley has recently been identified from the Navdatoli samples (Kajale, personal communication). Rice (*Oryza sativa L.*) occurs only in phases II and IV. Among other crops are the black gram (*urad*), green gram (*mung*), lentil (*Lens culinaris* Medikus) and grass (*Lathyrus sativus* Linn.). Besides, charred remains of linseed, *ber* and *amla* (*Phyllanthus embelia*) have also been found. But the diet of the people was not purely vegetarian; they also ate beef, pork, venison as is evident from the remains of animal bones.

Arts and crafts

The people used tools of stone and copper also. The stone tools, which are predominant, are all made on blades and over 23000 such tools have been reported from Navdatoli. The material of which these blades have been made is almost invariably milky chalcedony and very rarely carnelian, agate, jasper and quartz. For removing the blades, the core was first prepared with longitudinal crested ridge. Such crested flakes were prepared for facilitating an easy removal of parallel-sided flakes. But since the blades with crested ridge constitute only a minor percentage (3.71%) of the entire collection, it seems that the crested ridge was not always necessary for every flake to be detached. However, the excavators are of the opinion that the preparation of the core including the crested ridge was essential, but its exact function is not certain (Sankalia, Deo & Ansari, 1971, p. 256 and Subba Rao, 1955).

The socio-economic study of the chalcolithic blade flake industry shows that almost every household at Navdatoli prepared its own tools since all the tool types are evenly distributed in all the layers and in all the phases. Each household had a variety of blades and lunates and trapezes. Such tools as pen-knife blades and blunted back blades were hafted but the parallel-sided blades were probably directly used by hand. Serrated or saw-like blades were used with or without hafting. The lunates and trapezes, though few in number, might have been exclusively employed for hunting or fishing purposes, but not for cutting stalks of edible grasses as sickle teeth because they neither have the shine polish nor the striation marks (Sankalia, Deo & Ansari, 1971, p. 270-71).

Tools of copper were also used albeit on a restricted scale for the simple reason that the metal was scarce. They comprise tools like flat celts, chisels and weapons such as arrowheads and swords. The celts are flat and have a convex cutting edge. One of them, however, is a shouldered celt. Some specimens have shallow groups of circles which were deliberately made; their significance, however, is uncertain. The sword fragment has a mid-rib on both the faces which is betoken of its affinity with those from Iran (Sankalia, Deo & Ansari, 1971, p. 393). Copper was also used for making beads, bangles, rings and similar ornaments.

Religion

We can form a reasonable idea of the religion of the Malwa people from their cultural remains, more particularly those from Navdatoli. A huge jar is decorated with applique figurines of a female worshipper on the right and a lizard on the left and in between the two is what looks like a shrine. There are four such shrines on four sides and the entire shoulder of the jar is ornamented with applique patterns. Unfortunately many fragments of the jar are missing. The shrine appears to be that of a deity with whom alligator (*makara*) or lizard (*Godha*) is associated. In the historical period the lizard is associated with Parvati (*Banerjea* 1956, p. 101). There is an excellent illustration of Mahisa-mardini carved on the facade of the Chandragupta cave at Udayagiri (Madhya Pradesh) wherein the creature is shown stretched in two hands of the twelve armed goddess (*Banerjea*, 1956, p. 172). Similarly a bronze image of Simhavahini Durga from Nalanda has near the leg of the Devi, a creeping iguana (*Banerjea*, 1956, p. 501).

On the other side of the jar is depicted a shrine with a tortoise on its left. We do not know what was the motif on the right since the particular fragment is missing. Tortoise also appears to be a sacred animal to the chalcolithic farmers of the Malwa culture for we also have a tortoise amulet of shell from Prakash in Maharashtra which is also dated to the Malwa occupation of the site (*Thapar*, 1967, p. 115; Pl. XXII, 31). There is no doubt that the creature is sacred to the Hindus because it is one of the incarnations of Vishnu. Chattopadhyay (1970 p. 27) is of the opinion that the tortoise along with boar and fish were possibly totems of the people like Proto-Astrooids and the incarnations of Vishnu are indicative of their being merged into the Aryan society. Tortoise is known for its longevity and the tortoise amulets therefore may have been worn for long life. Such amulets were worn in the historical period as well (*Dikshit*, 1952, pp. 92-93). They are also to be seen in the necklaces worn by deities sculptured in Indian art (*Kramrisch*, 1960, Pls. 9-10). The distribution of tortoise amulets in space and time shows the popularity of the motif (*Dikshit*, 1968, pp. 96-97).

The portrayal of the shrine, the goddess and the creatures on the shoulder of the Navdatoli storage jar reminds us of the similar arrangement of the motifs on the perforated stone discs which have been reported from Mauryan levels of ancient sites from Taxila to Patna. Many such ring stones are to be seen in the Bharat Kala Bhavan, Varanasi (*Premod Chandra*, 1971). One such polished stone disc was found at Ropar which has been dated to Period III (C 600-200 B.C.). It is decorated with a hut which in all probability is a shrine, and a goddess on its left. There are more such figurines also. But on many such discs the goddess is shown accompanied by animals including alligators (*Banerjea*, 1956, pp. 168-73). They can therefore be identified as the representations of Durga because of her association with lizard.

Fire worship also appears to be in vogue during the chalcolithic times in Central India. Very interesting evidence of a fire altar came to light in the course of excavations at Navdatoli. Here, in a large squarish house, belonging to the earliest occupational phase, was found an intentionally dug pit in the centre of the house floor which, however, was completely burnt. The pit measured 7 ft. 8 in. by 6 ft. 5 in. and its depth was about 4 ft. 6 in. The corners of the pit were chamfered and its sides as well as bottom were plastered. In the four corners of the pit were found charred wooden posts while inside lay wood. The excavators have identified the pit as a *vedi* or *kunda* for performing sacrifices

and other rituals in Brahmanic or later Vedic parlance (*Sankalia, Deo & Ansari, 1971, p. 49, Pl. IV. b; Fig. 18.*)

An interesting representation of divinity of the Malwa people appears on a fragmentary channel spouted bowl from Navdatoli. It is a standing human figure with dishevelled hair which may be identified as proto-Rudra.

Contacts with West Asia

There are a number of artifacts, especially from the Navdatoli excavations which have close parallels in West Asia. Among these are pottery forms such as the channel spouted bowls, pedestalled goblets and midribbed swords. Sankalia (1963) has given an exhaustive account of these objects together with those from West Asia. The channel spouted bowl is paralleled at Tepe Giyan and the painting on its spout is similar to that on a specimen from Sialk (*Sankalia, 1963, p. 315-17; Figs. 1, 2, 4-7*). But identical bowls, which occur elsewhere in West Asia, are much earlier than the Navdatoli specimens whereas the one from Sialk is much later (C. 1000-800 B.C.) ; only the Tepe Giyan example is closer as it is dated to C. 1800-1700 B.C. ✓

The goblets or footed cups from Navdatoli, either painted or plain, bear a family resemblance with those from Sialk, Giyan and Hissar II, which, however, have a rather low and hollow stem, and are assigned to C. 3000 B.C. Sankalia (1963, p. 318) therefore cautiously observes: Hence we may once again not infer a direct influence from Sialk, Hissar or Shah Tepe, but postulate a general connection with these Eastern and Northern Iranian sites in about 1500 B.C. or say earliest 1700 B.C. He further adds : Whoever the inhabitants be at Navdatoli . . . the Puranic Haihayas or some such people—they were not direct immigrants from Iran or Central Asia. All their pottery is locally made, though showing distinct foreign affinities. This suggests acquaintance with the way of life in Iran and Western Asia, but considerably modified by local traditions. The use of linseed and lentil at Navdatoli also indicates such dietary habits, not mentioned in early or late Vedic literature (*Sankalia, 1963, p. 331*).

Authors

The question that should be finally posed is : Who were the authors of the chalcolithic cultures of Central India? No human skeletal remains have so far been found at any of the chalcolithic sites in Malwa and we have only the material equipment of the people. The authors of the Kayatha culture, as we have seen, were the pioneering colonizers of Central India; their culture does not seem to have evolved on the soil of Malwa but was already developed elsewhere. Their affinities with the pre-Harappan culture of Rajasthan, though not marked, are no doubt significant. Their successors in Malwa, the people of the Ahar culture, too were colonizers; their occupation at Kayatha only indicates the extension of their culture in the Banas valley in southeast Rajasthan, and it is only a passing phase in the protohistory of Central India.

We absolutely do not know anything about the authors of the Malwa culture. They too appear to have come from outside. Even the vast plethora of evidence from Navdatoli is in no way helpful in finding out the solution. The excavators have therefore marshalled the available ethnographic evidence. They (*Sankalia, Deo & Ansari, 1971 pp. 426-*

29) have postulated four possible claimants for the authorship of the Malwa culture as follows :

1. People from West Asia or Iran who seem to have gradually migrated to India and occupied Rajasthan, Central India and the Deccan.
2. The Bhils and other aboriginal tribes who once occupied the region but were pushed into the hilly areas by the Aryans or Sanskrit speaking people around 1200–1000 B.C.
3. Hitherto unidentified or unknown indigenous people who later merged with the Sanskrit-speaking People leaving little trace of their identity.
4. A primitive people like the Bhils who coming in contact with a few immigrant people or ideas from Western Asia developed into early farming, agricultural communities.

If we examine the evidence from excavations *vis-a-vis* the cultural level of the present day tribes in Madhya Pradesh, we are convinced that they hardly share anything in common with their chalcolithic predecessors. It is enigmatic that we do not have the evidence of the chalcolithic cultures being indigenous. ‘Everywhere it is the case of the people,’ the excavators aver, ‘who were there or arrived there with a full fledged knowledge of these arts and crafts. Hence there is no other term to designate such a stage than *colonization* (*Sankalia, Deo & Ansari, 1971, p. 429*). Earlier Sankalia (*Sankalia, Subba Rao & Deo, 1958, p. 252*) had propounded that ‘these might represent the so-called Aryan or Puranic tribes, for instance, the Haihayas with a number of their family members’ names ending in *asva*, and Haihaya itself meaning a horse or horse-riders settling down in the Narmada valley. Or else, these could be the aboriginal tribes — Nagas, pre-historic Andhras, Pulindas, Nishadas and Savaras.’

Although we cannot precisely say as to who were the authors of the Malwa culture, we may hazard a reasonable guess on the basis of the evidence from the excavations at Kayatha. The painted pottery of the Malwa culture can be said to be derived from the red painted buff ware of the Kayatha culture and the same holds good so far as the technology of copper and the specialized blade-flake industry are concerned. We can visualise that, by the middle of the second millennium B.C., some influences from Western Asia began to infiltrate through the north-western regions of the sub-continent. It would not be too bold to associate them with the Vedic Aryans. It is probably these people who introduced the West Asian elements in the Malwa culture. It was only by assimilating such influences that the culture was enriched. But one thing which seems to be certain is that the invading hordes from West Asia, if any, cannot be credited with the authorship of the Malwa culture. It must be agreed that all these painted pottery cultures of Central and Western India and the Deccan owe a great deal to the Harappans, at least for their painted black-on-red pottery. How far did they borrow from the neolithic farmers of the southern Deccan, we do not know. It is now established that the latter were the contemporaries of the Harappans. Could it be that the urbanized Harappans in the north and the neolithic villagers of the south began, sometime before the opening of the second millennium B.C., to spread in opposite directions? Although it is far-fetched to postulate such an hypothesis in the present state of our knowledge, a close scrutiny of the material equipment of the chalcolithic cultures leads us to identify the Harappan elements such as the tradition of the painted pottery, the blade industry and the metal technology on the

one hand and the neolithic tradition of round houses and the handmade coarse red/grey wares. This, however, will remain only a guess until some concrete evidence comes to light in near future.

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Early Farming Cultures of the Deccan

17

M. K. DHAVALIKAR

REMAINS OF an early farming culture of the Deccan were accidentally brought to light in 1950 at Jorwe (Dist. Ahmednager, Maharashtra). The discovery was reported by S. A. Sali in the local press and consequently the site, though considerably disturbed, was excavated on a small scale by H. D. Sankalia and S. B. Deo (1955). The culture, now labelled as the Jorwe culture after the type site, was placed in its proper stratigraphical context by the excavations at Nasik (*Sankalia & Deo, 1955*). This opened up a new phase in the protohistory of the Deccan and subsequent explorations and selective excavations have revealed a number of settlements of this culture in the Deccan. Although large tracts of the Deccan—the region between the Tapi and the Krishna—were first colonised by the people of the Jorwe culture, there is evidence to show that the neolithic farmers from Karnatak had already made inroads into the northern Deccan through the Bhima valley sometime during the opening centuries of the second millennium B.C., and slightly later we witness the arrival of the people of the Malwa culture on the scene. This is clearly established by the evidence from the excavations at Daimabad in the Pravara valley (*Dhavalikar, 1969-70*), and to some extent from that of Songaon in the upper Bhima valley (*Deo, 1969*).

The evidence from Daimabad, a deserted village on the left bank of Pravara which is a tributary of Godavari, shows conclusively that the pioneering colonisers of Maharashtra were the farmers from the southern Deccan. The extensive chalcolithic settlement at the site was dug by M. N. Deshpande of the Archaeological Survey of India in 1959 (*IAR 1958-59 : pp. 15-18*). The excavations brought to light a three-fold sequence of cultures. The earliest inhabitants were a neolithic folk using the coarse grey and/or red handmade pottery which resembles that from Brahmagiri in Karnatak. They introduced the food producing economy with all its concomitants in the Godavari valley. They possibly lived in humble dwellings of mud or thatched huts. A few patches of floors and some postholes were discovered in the course of excavations, but no complete house plan was found. What grains they cultivated we do not know for want of evidence. Animal bones were found in large quantities, and we will know about the domesticated species only when they are identified. For the present, however, we can definitely say that the Daimabad excavations have clearly established a neolithic subs-

tratum in the prehistory of Maharashtra.

When the neolithic farmers from the southern Deccan had settled in the Bhima and Godavary valleys, the late Harappans from Gujarat had started migrating in the Tapi valley through the Songadh pass. A few late Harappan sites have recently been discovered in Dhulia district (Sali 1970). This, together with the occurrence of pottery fabrics having close affinities with the Harappan, shows that the people lived amicably with those of the Malwa culture. But they are soon elbowed out by the latter as the evidence from Prakash demonstrates (*Thapar, 1967 : pp. 10-12*).

Malwa Culture

Around 1600 B.C. we find the Malwa culture people spread over a very large area. They were probably a cohesive group of people who, after establishing themselves in the Narmada valley, began to spread out from their habitat in Central India. They had no opening in the north because of the Vindhyan barrier and they, therefore, began to move southwards in the northern Deccan which was very sparsely occupied by poor neolithic communities. We therefore find the Malwa people soon occupying large tracts in the Tapi valley and certain areas in the Pravara-Godavari and the Bhima valleys. They flourished here for about two or three centuries. They introduced the black-on-red painted pottery and the use of copper in the Deccan. Their occupation at Prakash, Daimabad and Inamgaon was quite extensive. They, however, appear to be concentrated in the Tapi valley whereas in the Pravara-Godavari and the Bhima valleys their habitations were very thinly spread.

The people of the Malwa cultures lived in large rectangular houses as is clear from the Inamgaon evidence. A large rectangular house (6.6×4.42 m) was exposed at Inamgaon; its dwarf walls were flimsy and extremely thin (10 cm thick) and their extant height is 60 cm. (*Pl.I*). There were a number of post-holes outside the walls and some were inside also. The house was divided into two parts by a dwarf partition wall over which probably rested the reed screen. In the northern corner of the house was a *chulah* which is rectangular in shape and had a disc shaped clay stem in the centre in which was embedded a flat stone. It was covered with mud in order to support the cooking vessel. In the northeast corner of the house was a circular mud platform, 1.90 m in dia. and its height was 10 cm. Such mud platforms are still constructed in the house at Inamgaon where they serve to support large cylindrical storage bins made of wickerwork. The mud platform contains thorny branches of ber (*Ziziphus*) and sand in order to prevent rodents from destroying the grain in the bin. It should be noted that the platform in the Malwa house at Inamgaon also contained sand.

The Malwa people at Inamgaon also built pit houses. One such house was located adjoining the one described above. It was roughly circular on plan (maximum dia. 3 m) and its sides were perfectly vertical. Since the pit was considerably deep (1.23 m) a step was provided in the southern side for descending into it. The floor and sides of the pit were plastered with lime. There were several postholes along the periphery at the top for supporting the roof and the ground was provided with a gentle slope for draining out rain water, thus preventing it from getting into the dwelling pit. On the northeast was a double *chulah* which belonged to the occupants of the pit, thus indicating that cooking was done outside in the open. Two more pit houses, which were considerably smaller



Plate I : Inamgaon house, Period I, (c. 1500 B.C.)

and shallower and may therefore be described as sunken floors, were also recovered. One of them contained a twin urn child burial. It is worthy of note that even today such sunken floors and pit houses are constructed in and around Inamgaon. This is obviously due to the short lengths of *Babul* (*Acacia*) posts, and in order to obtain sufficient height for the structure, the dwelling pits are dug into the ground. Pit houses of the Malwa period have not so far been reported from any other site in the Deccan.

The Malwa culture is characterised by a painted ceramic which is rather thick in section and has a coarse, gritty fabric. It is wheel-turned and is treated with a thick orange to pink slip over which the painted ornament is executed in dark brown or black. The designs are mostly geometrical such as triangles and diamonds, either vacant, hatched or solid, and linear patterns and animals as well. The paintings are confined to the upper half of the vessel and are set in panels. The characteristic forms are a deep bowl with blunt carination on the body and a spouted vessel with flaring mouth. The latter is conspicuously absent at Malwa sites in Central India and seems to have been copied from the spouted jar of the neolithic farmers of the southern Deccan. Although the Malwa ware, so characteristic of the Central Indian sites, is present in the Deccan we find that its fabric in the Deccan is somewhat different. It is not gritty and unevenly baked as in Central India but is of fine fabric and is uniformly fired at high temperature and it may therefore be described as a regional variation of Malwa ware. The people also used a coarse, handmade red/grey ware which is identical with that of the southern neolithic. It is represented by big globular jars with flaring mouth, basins, deep bowls and a variety of knobbed lids.

The tools were of stone and copper. A majority of tools are of stone of silicious variety such as chalcedony and agate and are made on blade/flakes. Among these, we have pen-knife blades, parallel-sided blades, points, lunates, triangles and so on. They were hafted on a piece of wood or bone and a composite tool was made. Polished stone axes on dolerite also occur, but very rarely. They are obviously survivals of the preceding neolithic period. Copper was also used for making tools such as knives, chisels, fish-hooks, axes etc and also for making ornaments like bangles and beads. Two copper objects, the knife blade and the pin from Daimabad need a special mention. The former has parallels from Harappan sites (*Mackay, 1943 : Pl. LXIX, 2*) whereas the latter, which is a spiral headed p'n, can be compared with a Harappan specimen from Chanhudaro (*Mackay, 1943 : Pl. LXVIII, 9*), and is apparently of Iranian inspiration (*Piggott, 1962 : 227 & Wheeler 1966 : 51-52, Fig. 73*).

The mixed economy of the chalcolithic farmers of the Malwa culture was based on farming, hunting and fishing. Although their ancestors in Malwa cultivated wheat, they do not appear to have grown it in the Deccan possibly because of the absence of winter rains. Evidence from Inamgaon points to barley as the principal cereal grown by the Malwa people. The meat of the hunted animals, among which deer (*sambar*) appears to be common, and that of the domesticated animals such as cattle, sheep, goat and pig and a variety of fishes were included in the diet.

Evidence from Daimabad and Inamgaon throws a welcome light on the religious beliefs of the Malwa people. They probably worshipped a god which is represented on an elaborately painted jar from Daimabad which is a most beautiful piece testifying to the skill of the Malwa potter. It is a huge globular jar with a beaded rim and is profusely painted with a jungle scene in two compartments. The upper compartment shows a muscular figure of a man with two deer approaching it as if enchanted and peacocks in between ; the lower compartment has three tigers springing away in opposite direction. The human figure is solid while the animals are hatched in broken lines. The whole scene has a telling effect and the animals look like paying obeisance to their Lord, a sort of the latter day Pasupati. Exactly similar animals are painted on a vase fragment from Prakash (*Thapar, 1967 : 35, Fig. 12,3*). But the most important evidence is furnished by the recent discovery of a copper/bronze hoard from Daimabad which consists of a bull chariot driven by a man, and an elephant, a rhino and a buffalo, each standing on a platform with solid wheels below. All the objects from the hoard were probably used in some ritual procession and the man driving the chariot can therefore be identified as 'the Lord of the Beasts'—Pasupati (*Dhavalikar, 1975b*).

Some of the Malwa people in the Deccan had faith in life after death as is testified to by their burials at Daimabad and Inamgaon. At the former site a solitary burial was encountered ; it was complete skeleton of an adult placed in a specially dug pit in north-south orientation (*IAR 1958-59 : 18, Pl. XXIV-A*). It was, however, devoid of any burial furniture. At Inamgaon two twin urn burials of children were exposed. One of them was in a pit dwelling. It may be stated that this mode of the disposal of the dead is a distinguishing feature of the succeeding Jorwe culture and it can therefore be inferred that some of the Malwa people who continued to live even after the advent of the Jorwe people adopted from the latter this mode of the disposal of the dead.

Jorwe Culture

We have already narrated the circumstances of discovery of the Jorwe culture in 1950. Explorations during the last quarter century show that it was spread over a large area; its easternmost limit is the Purna valley in Vidarbha where Tuljapur Gadhi (Dist. Amaravati) was its outpost while in the north it is found all over Khandesh in the Tapi valley. In south, the Jorwe settlements have been noticed in the upper Krishna valley while Theur near Poona marks the western limit. Thus it was spread over the whole of the present state of Maharashtra except the coastal districts of Konkan. The Jorwe people had contacts with the neolithic farmers of the north Karnatak, the Malwa people of Central India and the Late Harappans and the Lustrous Red ware users of Gujarat. However, the nature and form of the cultural give-and-take has not yet been precisely ascertained. We also do not know for certain the various stages of development of the Jorwe culture; its origins and the end are as yet inadequately documented. However, it seems highly likely that the Southern Neolithic and the Malwa culture have contributed to a considerable extent in its make-up (*Dhavalikar, 1970*).

Ecology

The Jorwe culture flourished in the semi-arid zone of the Deccan plateau which is characterised by stony uplands and rugged valleys, but towards its rivers the boundaries slope into more open plains. The uplands have, in some cases, rich tracts of black cotton soil which is very productive even with a scanty rainfall. The areas along the river valleys have a fair share of the rich black soil but for which the soil cover is very thin. Consequently the region is throughout very sparsely wooded, and the vegetation cover is Xerophytic: *acacia*, *caparis*, tamarind etc. The region, however, was more wooded even till recently and the wild boar and the deer roamed here. But in recent times a serious depletion of vegetal cover has taken place as a result of felling trees and clearing land for agriculture and overgrazing which, in its turn, has affected the fauna. The region is now classed as semi-arid because of scanty rainfall which averages 50 to 100 cm. and is unreliable in the extreme, and consequently agriculture is reduced to a gamble with nature so much so that every third year is a bad year and every fourth, a famine year. Droughts are therefore far more common than good years. The construction of dams across various rivers, however, is changing the picture gradually. The principal crops today are Jowar (*Sorghum vulgare*), Bajra (*Penicillar spicata*), pulses, *kulith* (*Dolichos biflorus*), cotton and oilseeds such as *til*, *Karadi* and *alashi*, while wheat and very rarely rice are grown in small, carefully tended plots. Sugarcane is cultivated on a large scale in areas where canal irrigation facility is available.

Settlement pattern

A large number of sites of the Jorwe culture have been brought to light and among these the prominent ones which have been subjected to scientific excavation are Nevasa (District Ahmednagar), Bahal (Dist. Jalgaon), Prakash (Dist. Dhulia), Chandoli, Sonagao, Theur and Inamgaon (all in Dist. Pune) which are all located in Maharashtra. The excavations carried out so far point to the Pravara-Godavari basin as the nuclear

area of this culture and its peripheral zone extends towards the Krishna in south and the Tapi valley in north. The Jorwe painted pottery found at Navda Toli in Central India and as far down south as T. Narsipur near Mysore in Karnatak only points to the cultural contact between the Jorwe people on the one hand and the Malwa people in the north and the neolithic farmers in the south.

The Pravara-Godavari valley, the cradle of the Jorwe culture, appears to have been endowed with a most favourable environment which attracted the pioneering colonizers of the Deccan. The sites of Daimabad and Nevasa on the Pravara are located in a vast stretch of alluvium which is about three meters in thickness. This rich alluvial stretch was probably characterised by thick vegetation and was well watered by the Godavari and its tributaries. Thus the Jorwe culture people, who always preferred to be close to the source of water, established their settlements in the Pravara-Godavari valley whence they spread in the north in the Tapi valley and in south in the Bhima valley. Their habitations are found on the bank of a major river or its tributary. Every Jorwe village was a nucleated settlement with houses nestling with each other. A majority of villages consisted of only a few huts. In the Tapi valley we find a significant concentration of Jorwe sites, so much so that at several places there are two or three sites in the neighbourhood of many of the present villages. Proximity to farmland may possibly have been the guiding factor in the selection of a site for habitation. The heavy concentration of sites diminishes as one comes down south to the Pravara-Godavari valley and the Bhima valley. It should, however, be stated in this connection that although parts of the Tapi and the Pravara valley have been thoroughly explored, much remains to be done in the Godavari and the Bhima valleys.

The distributional pattern of the Jorwe settlements indicates that there were three main groups of concentration in the Tapi, Godavari and the Bhima valleys and each of these regions had at least one site which was the largest in the area. Thus we have Prakash in the Tapi valley, Daimabad in the Godavari valley and Inamgaon in the Bhima valley. At these three sites, the settlement was spread over an area of twenty hectares or more whereas the average size of a Jorwe settlement was not more than one to two hectares. There are, however, a few medium sized settlements such as Jorwe, Bahal and Nevasa.

Chronology

As already stated, the stratigraphical position of the Jorwe culture was first established in the course of excavations at Nasik (*Sankalia & Deo, 1955*) where it was found below the remains of the Early Historical period in the earliest levels and consequently it was dated to the first half of the first millennium B.C. But a series of radio-carbon determinations obtained for many other Jorwe sites shows that the culture can be dated to a still earlier period. It appears to have emerged about the middle of the second millennium B.C. in the Pravara-Godavari and the Bhima valleys as a result of the synthesis of the Malwa culture and the Southern Neolithic. But to a certain extent it can also be said to be the result of the internal development within the Malwa culture in the Deccan. The C-14 dates indicate that the Malwa people began their migration into the Deccan about 1600 B.C. or even earlier. Here they came into close contact with the neolithic farmers of the Southern Deccan who were already settled in the Godavari

valley from the beginning of the second millennium B.C. as is clear from the Daimabad evidence (*Dhavalikar, 1969-70*). This obviously resulted in the cultural give and take between the two people and ultimately led to the formation of the Jorwe culture (*Dhavalikar, 1970*).

The radio-carbon dates from sites such as Nevasa, Chandoli and Songaon indicate that the flourishing period of the culture seems to be 1300-1000 B.C. (*Agrawal, 1970 : pp. 96-100*). But the recent dates for samples from Inamgaon excavations show that the Jorwe culture can now be dated to Circa 1500-1000 B.C. because four dates from Inamgaon are pre-1400 B.C. whereas a majority of them fall between 1400-1200 B.C. which appears to be the heyday of the culture (*Dhavalikar, 1973*). There are two dates which are pre-1500 B.C. Of these, the one from Songaon is 1565 ± 110 B.C. (TF 384); it is possibly for period I which is neolithic. The other date of 1535 ± 150 B.C. (TF 1086) is from Inamgaon; it suggests that the beginning of the culture can be assigned to the middle of second millennium B.C. The cluster of dates in the 1400-1200 time bracket demonstrates that the culture had developed by then and had spread in different parts of the northern Deccan. The decline sets in around 1200 B.C. but this was possibly a temporary setback for there is evidence to show that the culture continued to survive for a couple of centuries more. It was thus far assumed that it vanished from the scene by 1000 B.C. but there is now conclusive evidence from Inamgaon and other related sites in the Bhima valley which shows that the Jorwe culture survived, albeit in a degenerated form, for some three or four centuries more. This decadent form of the Jorwe culture has been termed as the Late Jorwe as against the mature phase which has been referred to as the Early Jorwe.

There are a few radio-carbon assays for the Late Jorwe period from Inamgaon, but they are all for samples from the earliest levels of the phase; they all fall in the opening century of the first millennium B.C. But if we take into consideration the overlying deposit of about a metre and a half containing the cultural debris of the Late Jorwe, we can assign a span of about three centuries to the Late Jorwe period. It brings us on the threshold of the historical period, the beginning of which has been placed at 600 B.C.

Subsistence pattern

The Jorwe people subsisted on farming, hunting and fishing. The carbonised remains of grains from Inamgaon show that they raised a number of crops such as barley, wheat, lentil, *kulith*, grass pea and, very rarely, rice. They also collected fruits like ber (*jujube*) charred seeds of which have been found in the excavations of Jorwe sites. Perforated stones point to their use for hafting on digging sticks for turning soil. Our estimate of population and the food requirement leads us to believe that the Jorwe farmers must have cultivated the black cotton soil which abounds in the Deccan (*Dhavalikar & Possehl, 1974 : pp. 41-44*).

Barley appears to have been the principal cereal for it has been reported in large quantities from Inamgaon. It is a crop of short duration and can be raised without difficulty in a semi-arid environment. The next important crop was wheat. Although the farmers of the Malwa culture grew wheat in Malwa, they do not seem to have cultivated it in the Deccan because the cereal has not so far been reported from the Malwa levels of any chalcolithic site in the Deccan. Wheat is a *rabi* crop which requires winter rains. The semi-arid tracts of the Deccan do not receive winter rains and consequently

wheat could not have been grown by the people of the Malwa culture in the Deccan. In all probability the Jorwe farmers, more particularly those at Inamgaon, could grow wheat because of the supply of water which was stored in the channel dug along the embankment which they had constructed to divert the flood water of the river Ghod.

The crop pattern suggests that the rainfall during the Early Jorwe period at Inamgaon was considerably more than it is today or else the crops such as the *Dolichos lablab* could not have been raised. This variety of pea is presently nowhere cultivated around Inamgaon but is grown some 80 km upstream of Ghod in the region around Narayangaon near the source of the river where the rainfall is around 80 to 90 cm. More rainfall then would have caused more floods in the river Ghod and since there was a possibility, howsoever remote, of the habitation at Inamgaon being washed away by the floods, the Early Jorwe people there built a massive embankment (about 240 m long and 2.25 m wide and high) for diverting the flood water through a channel which was sufficiently deep (3.50 m) and wide (4 m) and about 200 m long which incidentally was also used for storing water. This water could have been used for irrigating fields nearby. This also explains the cultivation of rice which must have been grown in small, carefully tended plots.

Large saddle querns were used for making flour of barley and wheat and bread or rather chapati was baked on an earthern pan which was joined to the central stone in the *chulah* with clay as evidenced at Inamgaon. *Kulith* (*Dolichos biflorus*) was probably converted into gruel as is the practice in the southern Deccan at present. The absence of dishes in the repertoire of pottery forms in the Jorwe ware and even in the handmade red/grey ware is betoken of the food being semi-liquid which was taken in the carinated bowls and the barley or wheat cake was simply taken in the hand as the farmers do today.

Among the domesticated animals were cattle, buffalo, goat sheep, pig and horse, though rare. Among the hunted animals deer appears to have been favourite. Animals, domesticated and hunted, were roasted in large fire pits which have been exposed at Inamgaon. Camel is reported from Inamgaon but we do not know whether it was of the domesticated species (*Clason, n.d.*). Fishing seems to be much too common as the evidence of fishhooks shows.

Community pattern

A number of houses of the Jorwe people have been laid bare in the course of excavations at Inamgaon. They seem to have adopted the house plan of their predecessors at the site—the people of the Malwa culture. They are all rectangular on plan, measuring about 5×3 m. The floor was made with due care and plastered with cow-dung and lime. The walls were wattle-and-daub constructions and the roof above was probably conical. There appears to be some modicum of planning the settlement because the houses were found to have been located about a meter and half from each other, the intervening space in between forming a sort of road or lane. The alignment of the houses suggests that it was probably a linear settlement which is also corroborated by the rectangular shape of the mounds at Inamgaon. A most important feature of the pattern of settlement that has been revealed by the Inamgaon excavations is the location of the craftsmen's quarter on the western periphery of the principal habitational area.

(INM I). Although the excavations have so far been confined to the western part of the principal mound and to a part of the central area of the principal mound (INM I), they have brought to light a number of houses which, on the basis of their contents, can be identified as those of craftsmen such as the potter, ivory-carver, coppersmith, goldsmith, lime-maker etc. It is clear that right from the beginning of the habitation the craftsmen's houses were situated on the western periphery of the main mound (INM I) just on the left of the entrance to the settlement, and the same pattern continued in the subsequent periods. It is interesting to note that the same pattern prevails even today in the villages in central Maharashtra. Tradition dies hard!

The houses in the craftsmen's quarter usually have pit silos in them, but the houses in the central part of the mound did not have such pit silos dug into the ground; the people there stored grain in huge four legged jars which were supported by four flat stones. The pit silos were dug into the house floor. They had perfectly vertical sides and flat bottom and were lined with lime which obviously served as an insecticide. The pit silos first appear in the Malwa period and continue in the subsequent periods. An average pit silo is a metre or a meter and half deep and has a diameter of one metre. In one of the pit silos the base was found to have been covered with grass. The occurrence of pit silos in the houses of craftsmen suggests that their need to store grain was perhaps greater than their fellowmen in the central part of the settlement. The craftsmen's work was undoubtedly a full time job and the community must have paid them in exchange of their services in kind; that is in the form of grain, once or twice a year at the time of harvest, and hence the need to store the grain properly. This reminds us of the *Baluta* system which was in vogue till recently in some parts of the northern Deccan according to which the craftsmen such as the potter, cobbler, blacksmith, carpenter, and others were paid in kind at the time of the harvest for their services. There were twelve such *Balutedars* or craftsmen and others who rendered service to the community. The Jorwe craftsmen probably received coarse grain such as barley and *Kulith* (*Dolichos biflorus*) which they stored in the pit silos in their houses because wheat can only be stored in bins above ground as it cannot stand the heat below ground. Even now in the villages in the northern Deccan wheat is stored above ground in bins whereas *jowar* is stored in the underground silos or *balads*.

The houses in the central part of the principal habitation area (INM I) at Inamgaon probably belonged to the men of means. One of them had successfully repaired floors and had arrangement for draining out rain water from the roof. One of the burials in the house contained a skeleton of inordinate height (1.83 m) and its lower extremities were intact in sharp contrast to the normal practice of chopping them off. It is therefore obvious that here was a person to whom the normal rules of the community were not applied, and he was therefore possibly an important person in the settlement. Another house nearby yielded a clay box containing a mother goddess and over it was another mother goddess without head and also a bull, all of unbaked clay. But the largest house was a five roomed structure which covered an area of 25x10 m. The burial encountered in the house and its very dimensions lead us to infer that it was perhaps the residence of the ruling chief of the community because all other houses so far unearthed are single room units. Moreover, its proximity to the granary also indicates that he collected taxes from the members of the community in the form of grain which was stored in the granary adjoining his house.

Material equipment

The distinguishing feature of the Jorwe culture is its painted pottery which is quite rich in form and design element (*Fig. I*). It is fine in fabric and is well baked. The uniform striation marks show that it was turned on a fast wheel. It has a red or bright orange matt surface on which was executed painted ornamentation, usually geometric, in black pigment. The characteristic shapes comprise a concave sided bowl with sharp carination, a spouted jar with flaring mouth and high necked jars with globular profile. Besides, coarse, handmade red/grey pottery was also used. It is represented by such utilitarian forms as the dough-place, the platter and storage jars with globular body and a wide flaring mouth, and bowls and basins of varying sizes. Lamps, oval in shape and with a central groove for the wick or squarish ones with pedestalled bases, are also in the red/grey ware.

The Jorwe pottery was fired in a specialized kiln which has been unearthed at Iramgaon (*Pl. II*). It resembles a huge trough of clay, built on stone foundation. Its maxi-



Plate II: Iramgaon Potter's kiln Period II c. 1300 B.C.

mum dia. is 1.75m and at a depth of 60m from the top were found oval clay cushions placed over the fire chamber which was at the base. They have a hole in the centre and grooves on sides which served as outlets for the hot gas coming up from the fire chamber. At the base of the kiln were flues or air ducts radiating from the centre. Although the kiln has no parallel in the country, it is akin, in principle, to those from Indus cities which were brick built and were provided with several holes for the hot gas (*Sankalia, 1970: pp. 13-15, Figs. V-VII*).

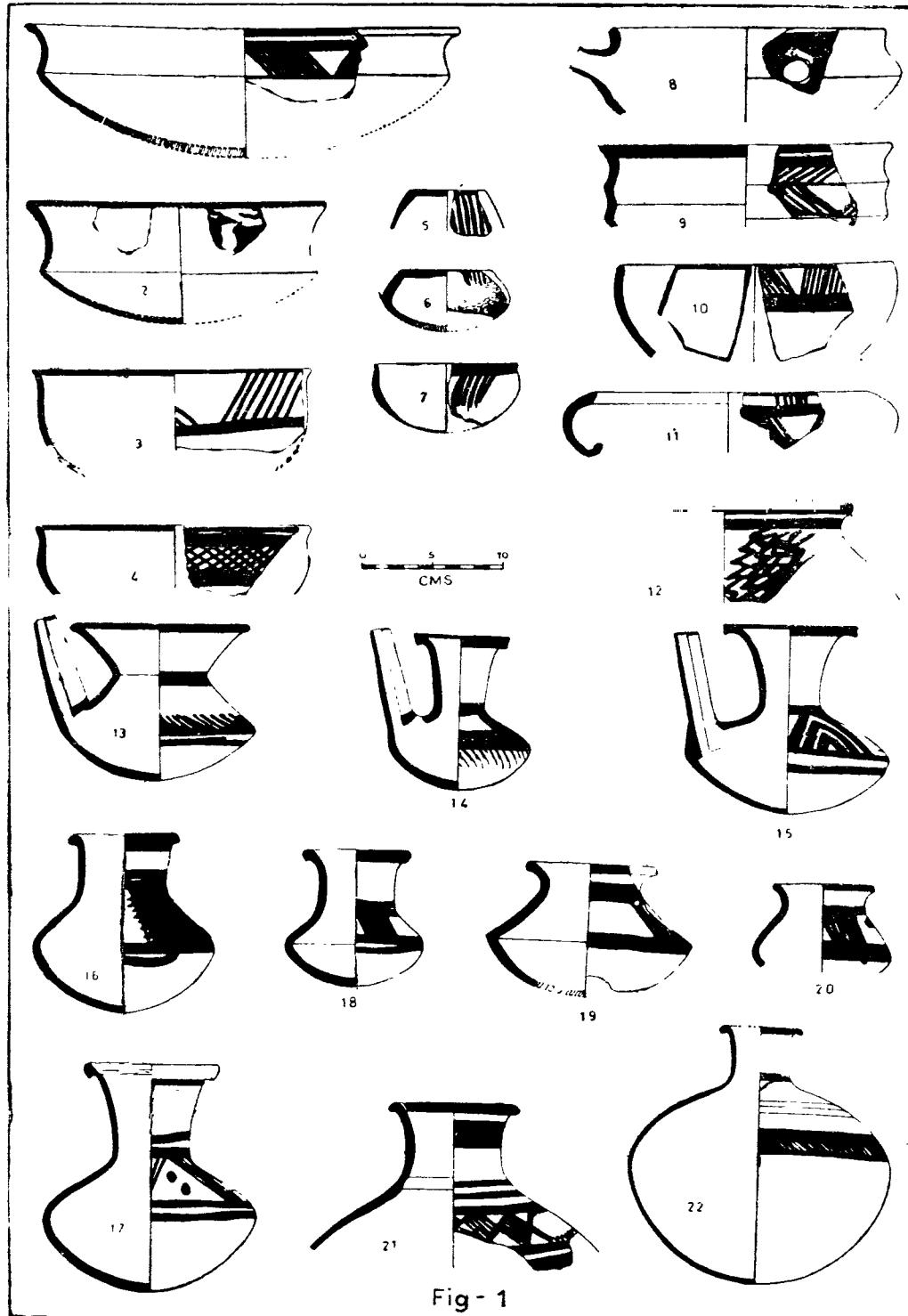


Fig. 1

Fig. 1: Jorwe Ware

The specialized blade-flake industry of silicious material such as chalcedony and agate is another characteristic feature of the Jorwe culture. Polished stone axes and chisels of dolerite were also used, though rarely. Copper was doubtless scarce and was sparingly used for making axes, chisels, knives and fish hooks and also for beads and bangles. The chances of the metal being imported from the distant Khetri mines of Rajasthan are slim because native copper and chalcopyrites have been reported from the vicinity of Inamgaon. Lumps of native copper were obviously heated and beaten into desired shapes. For extracting copper from chalcopyrites special furnaces were built and one such furnace is reported from Inamgaon (*Dhavalikar, 1975c*). It is a boat shaped structure built of clay on stone foundation having a clay cushion similar to that in the kiln for keeping the ore. Stylistically, the furnace bears a family resemblance with the bronze age furnaces in Israel which are dated to the middle of the second millennium B.C. (*Tylecote, 1962: 25-27, Fig. 39*).

Personal ornaments were mostly composed of beads of chalcedony, agate, carnelian and varieties of jasper. Only well-to-do people could have afforded bangles and anklets and necklaces of copper beads strung in silken thread as the Chandoli evidence would show. (*Deo and Ansari, 1965:23*). Gold beads and spiral ear ornaments with thickened terminals, though extremely rare, have also been reported; the former from Daimabad and the latter from Inamgaon. They only source for gold was the Hatti mines in Karnataka which were worked from the neolithic times and metal must have been brought to the northern Deccan by way of trade, but that the ornaments were made locally is established by the find of a crucible and a pair of copper tongs at Inamgaon. Beads of ivory have turned up in good numbers at Inamgaon and, what is more, a large piece of ivory was found in the Malwa levels attesting to the manufacture of beads at the site. Elephant too was roaming around Inamgaon during the chalcolithic times (*Clason, 1973*).

Religion

It has become possible to have an idea of the religious beliefs of the Jorwe people, on the basis of the excavated evidence. Female figurines of clay, either baked or unbaked, have been reported from Inamgaon and Nevasa. That they were goddesses which were worshipped is evident from the discoveries at Inamgaon. The goddesses were of two types viz. those with head and the others without head. There are several examples of the former class. Of these, the one from Nevasa is quite big in size and is nothing but a large stemlike object with its sides tapering towards a trumpet base (*JAR 1959-60 : 28, Pl. XXXI-B*). The top is pinched to indicate the head, the hands are only short but slightly curved projections; the breasts too are small and are marked by pinching. It is thus an inarticulate figure which was connected with fertility.

A few clay figurines, mostly unbaked, have been reported from Inamgaon. They too are inarticulate, for there is no attempt at showing the anatomical features except the breasts which help us in identifying them as female figurines. One of them bears punctured marks around the neck indicating the bead necklaces. Two figurines represent women of ponderous proportions; they have large pendant breasts indicative of fertility. All these are inarticulate figurines which are strikingly similar to the 'timeless' types of the pre-Mauryan and the Mauryan period.

Two extremely interesting figurines have been reported from Inamgaon. The

circumstances of their discovery suggests that they were god desses and worshipped as such. They were found buried in a small hole in the floor of a house datable to C. 1300 B.C. Of these, the figurine with head was placed within an oval receptacle of clay (*Pl. III*) and over it was the goddess without head and a bull. All the objects in this group are unbaked. The goddess in the receptacle has large, heavy breasts which are indicative of fertility. The head is shown by pinching while the legs are short and stumpy. The figurine was meant to be kept in a standing position in a clay ring which has also been found. The other female figurine is without head. It is characterised by a flat body and short curved hands, but the portion below the waist is unfinished. She appears to be the prototype of the goddess Vishira of the *Mahabharata* (*Salya Parva*, 46,29) who was connected with the welfare of the children. Curiously enough, the figurine has a blind hole in the abdomen and there is another such hole in the back of the bull which was found



*Plate III : Inamgaon-clay recept: ce
containing Moter Goddesses Period II
c. 1300 B.C.*



Plate IV : Inamgaon-Child burial (c. 1400-1000 B.C.)

by her side, over the receptacle. When a stick is inserted in both the holes, the goddess perfectly sits over the bull and it is therefore not unlikely that here we have the beginning of the concept of the *vahani* which becomes so common later in the historical period.

Burials

An important feature of the Jorwe is the mode of the disposal of the dead. Usually the adults were buried in an extended position whereas the children were accommodated in two coarse, handmade red/grey ware urns, placed horizontally mouth-to-mouth in a pit (*Pl. IV*). The pit for both men and children was dug into the house floor and very rarely in the courtyard of the house. This was probably done because the people desired to have the departed soul within the precincts of their residence. In case of adults the portion below the ankle was deliberately chopped off because the people probably did not want the dead to go away. This can be explained as the fear of the dead who usually was supposed to turn into a ghost, for very idea underlying the burial in a pit below the house floor or a cairn was motivated by the fear of the ghost soul, and those who were living always tried to control the actions of the ghosts of the dead.

Adults as well as children were buried in a north-south direction with the head towards north and the legs towards south. In the burial pit we usually come across two vessels—a carinated bowl and a spouted jar—both of the painted Jorwe fabric. They must have contained food and water respectively for the dead. More than two vessels are also found in some burials, but in some cases no pottery vessels of any kind were found. This may be taken of the economic conditions of the family. In one case, a flagon with a high, narrow neck was found; it obviously must have contained wine for the dead. Sometimes, the skeletal remains of a child were deposited in a single urn which was placed vertically as at Nevasa (*IAR 1959-60* : p. 28). These single urn burials need not be taken to reflect the economic condition of the family but may belong to a different social group which practiced this particular mode of burial. The same, however, does not hold good in case of child burials wherein more than two grey ~~were~~ urns ~~were~~ used for accommodating the body of the dead for the simple reason that it was necessary in the case of teenagers who could not be accommodated in two urns. Instances of three or five urn burials have been reported from Daimabad (*IAR 1958-59* : p. 18, *Pl. XXV-B*) and Nevasa (*IAR 1959-60* : p. 30, *Pl. XXX-B*) respectively.

Among the Jorwe burials, the most interesting and unique is the four legged urn burial from Inamgaon which belongs to the end of Early Jorwe and the beginning of the Late Jorwe and has therefore been dated to C. 1000 B.C. (*Pl. V*). It has so far no parallel within the country. The urn is made of unbaked clay and has four short stumpy legs. The jar is 80 cm high and 50 cm wide and one of its sides is modelled in such a way as to resemble the abdomen of a female. It contained the skeleton of a male, about 40 year old, placed in a sitting posture, but in the process the knees were flexed up when the head was pressed down to simulate the foetus in the uterus. But the portion below the ankles was infact in this case and not chopped off as was the convention of the community. By the side of the head was a painted spouted jar and a carinated bowl ; the former is painted with a boat design having long oars. The boat motif becomes significant in the light of the current Hindu belief that the departed soul has to cross waters in a



*Plate V : Inamgaon-adult bur.al
c. 1000 B.C.*

ferry in the heaven.

In an earlier level but just close to the burial described above, was yet another burial which consisted of one four legged jar and another similar jar cut into half and placed by its side. Inside these were no skeletal remains but only a painted globular jar with a lid over it. The burial was found in the courtyard of the five roomed house already described. It therefore probably represents a symbolic burial of a person whose body could not be retrieved, for he may have died an unnatural death. Perhaps he may have died in a battle with a neighbouring tribe in which case there is every possibility of his dead body missing in the turmoil. The person may have ranked very high in the social hierarchy ; he may even have been the ruling chief whose successor was probably buried in the four legged jar described above.

Decline of the Jorwe culture

The Jorwe culture flourished in the Deccan for about four centuries and by c. 1000 B.C. we find that the Jorwe habitations in the northern Deccan were deserted all of a sudden and the whole activity comes, as it were, to a grinding halt. The principal cause of this appears to be the increasing aridity which is stratigraphically represented by a weathered layer at Nevasa (*Mujumdar and Rajguru, 1965: p. 152; Dhavalikar 1973: pp. 143-44*). The acute famine caused the economic decline which is reflected in the Late Jorwe phase which is well represented at Inamgaon and other sites in the Bhima valley. The degeneration once set in continues, and what we have in the Late Jorwe is the jejunes shadow of the once flourishing Jorwe culture. The adverse economic conditions probably led to large scale migrations down south in the Krishna valley (*Sundara, 1968 & 1970*) and some of the people reached as far south as T. Narsipur in the Kaveri valley.

The Late Jorwe culture is characterised by coarse painted black-on-red pottery which represented such shapes as the convex-sided bowl and the channel spouted bowl. The poverty of the people also becomes evident in their small round huts (*Pl. VI*) in sharp contrast to the large rectangular houses of their predecessors at Inamgaon. The people continued to make tools of stone blades and flakes and buried their dead in the house floor. Later, in c. 800 B.C. they come into contact with the people of the southern Deccan as the occurrence of the black and red ware at Inamgaon shows. This phase of the Late

Jorwe culture can be dated to C. 1000-700 B.C. which incidentally brings the stroy to the threshold of the historical period the beginning of which is assigned to C. 600 B.C.



Plate VI : Inamgaon-Round hut of late Jorwe Period c 1000 B.C.

Authors

It is not easy to form a clear idea as to who exactly were the authors of the Jorwe culture. We have, however, the skeletal remains from several chalcolithic sites in the Deccan, and although many of them have not been studied properly, we can know about the racial types of those which have been studied. But a majority of the burials which have so far been unearthed, represent the mortal remains of children indicating the high mortality rate among the children. Besides, the state of preservation of the skeletal remains is also highly unsatisfactory ; usually the skull is found broken into pieces because of the load of the strata above. Consequently only those few skeletons, which were found in a good condition and which could be reasonably reconstructed, have so far been studied.

The skeletal remains from Nevasa were studied by Sophie Ehrhardt. She found a majority of the skeletons fragmentary in nature. One which she could examine thoroughly was that in Burial No. 10. It was probably of a woman of 20 years of age having a cranial capacity of 1330 c.c., a value too high for the aboriginal females of India. The skull of the woman was broken into many pieces and the frontal bone was completely missing. The skull, on examination, was found to show a dolichoid form. Similarly, the crania of the skeletons from Burials 1 and 28 which represented children, 2-3 years and six months

old respectively, are also dolichocephalic. The statue of the skeleton from Burial No. 10, as calculated from the bones of the upper extremities, gives a medium height if it is a male skeleton and a great height if it is a female skeleton. Although Ehrhardt is inclined to identify the skeleton as that of a female (*Sankalia, Deo, and Ansari, 1960; p. 517*), it is probably a male in the opinion of S.S. Sarkar (1972, p. 12) in view of the broad forehead, high vault, large face and teeth, the broad and muscular mandible and the cranial capacity. Racially this skeleton, according Ehrhardt, indicates "Characteristic of the primitive people in the jungles of the Deccan" (*Sankalia, Deo, and Ansari, 1960, p. 520*).

The human skeleton remains from Chandoli were studied by K C. Malhotra (Malhotra in *Deo & Ansari 1965: Appendix I*). Of the two burials, Nos. 16 and 24, the former was that of a male aged 20 to 25 years, whereas the latter was a 2-3 year old child (?). The person from Burial N. 16, which has been studied in detail, was a long headed individual. According to Malhotra, the skull of the individual, "shows closer affinities with Mohenjo-Daro skulls (Nos. 6, 7, 9, 19, 19 and 26) which.....are Mediterraenean in characteristics" (Malhotra in *Deo & Ansari, 1965, p. 176*). The adult male skeleton, from Inamgaon near Poona, which was recently discovered, has also been identified by Malhotra (personal communication) as of the Mediterraenean type. All this would show that the authors of the chalcolithic cultures of the Deccan, more particularly those of the Jorwe culture, were racially of the Mediterreanean type. But a word of caution is necessary in this connection because the term 'Mediterraenean' has come to be applied to peoples so different as the natives of Spain, Arabia and India. And what is more, apart from the dark colour of the skin, there are many points of resemblance between the Dravidian and the Mediterraean peoples which points to a connection between the two, probably because of common origin. Since the Mediterraenean type also constituted an important element of the Harappan population, and the Dravidians or the Australoids formed the dominant element in the neolithic population of the south, we can visualize their contribution to the make-up of the chalcolithic cultures of the Deccan.

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Black-and-Red Ware

A Cultural Study

18

H. N. SINGH

THE BLACK-AND-REDware was first designated as such by Sir Mortimer Wheeler about two decades ago. However, for a long time, this ware was supposed to belong to Early Historical horizon and was termed as the Satavahana Ware. Alongwith the Megalithic black-and-red ware and some associated wares, for a long time, it was considered to be of Early Historic character. However, it is now more than certain that the ware is of greater antiquity than hitherto advocated. This has been positively confirmed by the find of this ware in the chalcolithic and other proto-historic contexts. This necessitated a revaluation of the problem in its entirety.

So far, scholars had studied this ware in terms of shapes of the pots, thus overlooking its associated cultural equipments and chronological assignments. Evidently their studies had fallen short of a fuller assessment of the personality of this ware. In their studies, various scholars had sought to associate this ware with one or the other group of people but taking into consideration its wide cultural associations, chronological assignments, changing technological personality and varied typological personality, it would only be too hazardous to identify it with any race or groups of people.

CULTURAL AND CHRONOLOGICAL IMPORTANCE AS ADVOCATED BY WHEELER

Until 1945, sites after sites were being "ransacked rather than excavated" in south India yielding, in the process, burial remains of megalithic character, including, besides other material relics, a characteristic ware distinguished by fully black interior and partially black and largely red exterior. Wheeler's systematic and scientific probings carried through extensive excavations at Arikamedu (1945) and Brahmagiri (1947) *a merveille* 'opened up' a new vista in the archaeological activities of south India. It *en effect* stabilised the Megalithism and *inter alia* the black-and-red ware both culturally as well as chronologically. He dated the black-and-red ware in relation to the megalithic burials of south India. According to him, this Megalithic ware had a life-span between C. 200 (or a little later) to the middle of the first century A.D. (*Wheeler, 1948, pp. 200-202*). In one

of his later works, Wheeler (1960, p. 163) adds that "in review, there is at present no evidence for ascribing any south Indian megalith to a date earlier than the 3rd century B.C., and the 3rd century B.C.—1st century A.D. is here accepted as a provisional time-bracket".

FURTHER RESEARCHES IN POST-INDEPENDENCE ERA : BLACK-AND-RED WARE IN PROTO-HISTORIC CONTEXT :

Since independence, a host of sites have been plotted on the archaeological map of India through sustained spade-work undertaken by different teams of archaeologists in different parts of the country. One of the major contributions of these invaluable works was the shedding off of the supposed exclusive burial character of the black-and-red ware and its entrance into the chalcolithic framework of Indian Archaeology. Recognizing its increasing chronological importance and cultural association in view of the 'evidence of continuity' accumulating as a result of excavations at Lothal, Rangpur and Rojdi, Wheeler (1960 : pp. 116 and 165) too modified his view in respect of the black-and-red ware and placed it within the general limits of the 1st millennium B.C. He (1960 : p. 166) visualized an earlier date for the black-and-red ware when he observed that 'the probability of an earlier date in Kathiawad depends upon a further examination of Lothal or some equivalent late-Harappan site'. Verily, it has since then come true.

WIDE OCCURRENCE IN TIME AND SPACE

The post-independence era of Indian archaeology witnessed a phenomenal spilling over of its frontiers, both spatially as well as chronologically.

Thus, in India, it is recorded from Rupar in the north to Adichanallur in the south, and from Desalpur in the west to Pandu Rajar Dhibi in the east.

Outside India, it is reported from ancient Egypt and modern Africa. In ancient Egypt, it is reported from Tumas in the Nubian Valley, where it has been described as a "black-topped pottery" (Lal, 1963, No. 6455 ; Lal, 1964, : pp. 62-63, pl. XXXV ; IAR, 1961-62 : pp. 67-70, pl. CXV, A and C, CXVI, A and B ; Srivastava, 1971 : p. 374).

In India, the occurrence of the ware ranged in time from the middle of the third millennium B.C. down to the beginning of the Christian Era.

Outside India, the ware is credited with an earlier date. It was known to the ancient Egyptians as far back as 4th millennium B.C. The ware continued to be known to the ancient Egyptians down to the close of the second millennium B.C.

As a sequel to these far-reaching probings, the post-independence era witnessed the emergence of at least the following four Schools of Thought in regard to the cultural and chronological character of the black-and-red ware :

- (i) those who believed that it has only a technological personality irrespective of its vast expanse in space and wide horizon in time ;
- (ii) those who advocated that it is a single culture complex associable with ancient most races or people of India, e.g., Dravidians, Aryans, Vratyas, Turvasus, Yadavas, Bhils, etc ;
- (iii) those who proposed the identity both in the similarity of technique as well as in the

- oneness of its cultural composition notwithstanding its widespread distribution both in space and time ; and,
- (iv) those who opined that the black-and-red ware discovered in the Chalcolithic/Proto-historic context is different from that discovered in the Iron Age deposits/Megalithic context.

II. Wide Cultural Associations

As pointed out earlier, this ware seems to have had a wide cultural association. Right from the Pre-Harappan levels down to the early centuries of the Christian Era, this ware has been unearthed. Thus, we notice a varied cultural association. Therefore, this ware possibly had a varied personality. The following break-up in respect of its cultural association may enlighten this point considerably :

1. *Neolithic context* : e.g., Chirand, Piklihal, etc.
2. *Pre-Harappan* : e.g., Lothal.
3. *Harappan* : e.g., Lothal, Rangpur, Rojdi, Somnath (Prabhas Patan), Bhagatrav, Lakhabaval, Amra, Kanasutaria, Alau, Hasanpur, Desalpur, Surkotada, Rupar, Kotadi, etc.
4. *Post-Harappan Lustrous Red Ware Culture* : e.g., Rangpur, Hasanpur, Mota-Machiala, Sujnipur, Kanasutaria, Alau, Prakash, Chandoli, Ahar, Somnath (Prabhas Patan), etc.
5. *Post-Harappan Chalcolithic Culture* : e.g., Malvan, Jokha, Gilund, Pandu Rajar Dhibi, Mahisdal, etc.
6. *Ahar/Banas Culture* : e.g., Ahar, Agtari, Balathal, Bansen, Champakheri, Chosla, Darauli, Fachar, Gadriawas, Gondi, Hingwanio, Hironji-ka-khera, Jawad, Joera, Kadukota, Keli, Kheri, Khor, Menal, Nangauli, Rupawali, Sialpura, Sirdi, Tarwat, Umand, Undala, Viroli, etc.
7. *Chalcolithic Culture* : e.g., Chirand, Ashrava, Ashta, Badnapur, Banyakhedi, Basantapur, Hotoda, Koparli, Kuhurmunda, Kumshi, Makavana, Mangalkot, Old Alatala, Pimplas, Ranigam, Sarangpur, Satola, Udhampur, etc.
8. *Central Indian Chalcolithic Culture* : e.g., Navdatoli, Kayatha, Eran, Avra, Manoti, Besnagar, etc.
9. *Northern Deccan Chalcolithic Culture* : e.g., Prakash, Chandoli, Theur, Bahal, Tekwada, Bahurupa, Inamgaon, etc.
10. *Northern Karnatak Chalcolithic Culture* : e.g., Tekkalakota, Urchan, Kumshi, Ingalmi, Dhulkhed, Jirakalgi, Watgal, Hingni, Masali, etc.
11. *Jorwe Ware Culture* : e.g., Prakash, Theur, Inamgaon, Songaon, etc.
12. *Late Pre-Iron Levels (Chalcolithic)* : e.g., Kesrapalli.
13. *Proto-historic Period* : e.g., Amaval, Andhi, Bairat, Banda, Barahuli, Barthia, Bhadauli, Durhanpur, Chanahta, Chandauli, Dhus, Ganj, Itwan, Jasuri, Kanwan, Lathaura, Machiyan, Panchwania, Sikandarpur, Takiyapar, Una, Warthan, etc.
14. *Posterior to O.C. Ware and anterior to P.G. Ware* : e.g., Atranjikheda, Noh.
15. *Post-Chalcolithic Culture context* : e.g., Nagal.
16. *Painted Grey Ware context* : e.g., Atranjikheda, Hastinapur, Alamgirpur, Khalua, Kaseri, Noh, Rupar, Sohgaura, Kausambi, Allahapur, Apra, Asara, Ashapur,

- Autha, Chosla, Dhonder Khera, Gondi, Humayun Khera, Jakhera, Kariwaki, Nakora, Raniya, etc.
17. *With Grey Ware in the Bikaner region :*
 18. *Pre-N.B.P.W. context :* e.g., Sonpur, Prahladpur, Masaon, Ujjain, Nagda, Maheshwar, Rajghat, Bahal, Nevasa, Sarai-Mohana. Somnath (Prabhas Patan), etc.
 19. *N.B.P.W. context :* e.g., Sohgaura, Sonepur, Kayatha, Prakash, Somnath, (Prabhas Patan), Prahladpur, Masaon, Ujjain, Nagda, Maheshwar, Rajghat, Asohna, Babukasiktaur, Bahal, Bairat, Bakarganj, Baniya, Barehat, Barkad, Besnagar, Chandraketugarh, Chebrolu, Chirand, Faridinagar, Jamdara, Kailas, Kanheri, Rudauli, Sarai-Mohana, Savalda, etc.
 20. *Early Iron Age :* e.g., Noh, Atranjikheda, Kausambi, Chirand, Hallur, Nagar, etc.
 21. *Iron Age Deposits :* e.g., Bahal, Kesarpalli, Pikihal, Bilawali, Jaugad, Mahisdal, Pandu Rajar Dhibi, Tulsipur, etc.
 22. *Early Historical Period :* e.g., Jokha, Eran, Avra, Tekkalakota, Besnagar, Aderkatti, Broach, Chandapur, Daradgaon, Fatepur, Ghantasala, Hampasagar, Jategaon, Kamrej, Londikolyachi-haveli, Manigramam, Nasik, Nevasa, Porkalam, Rayatale, Singupuram, Sisupalgarh, Timbarva, Ukkunda, Utnur, Vadner-Budruk, Wavrat, Yattinhalli, etc.
 23. *Historical Period :* e.g., Amreli, Broach, Dhatva, Kalingapatnam, Saradkel, Sravasti, etc.
 24. *Megalithic context :* e.g., Amrithamangalam, Banimilia-Bahera, Brahmagiri, Chandravalli, Dharanikota, Gonakanahalli, Kokoria, Ittagi, Junapani, Khapa, Kotia, Maski, Nagarjunakonda, Paiyampalli, Sangankallu, T. Narsipur, Vanagiri, Yeleswaram etc.
 25. *Rock-cut cave (burial) context :* e.g., Elambulassery, Mangad, Mayppayur, Quilandy, Triprangode, etc.
 26. *Russet-coated Painted Ware/Andhra Culture :* e.g., Alagarai, Belgaum, Brahmagiri, Chandravalli, Devalgi, Gudgul, Hildahalli, Kadar Mandalgi, Lakkundi, Madapur, Paiyampalli, Pedda Bankur, Sasankot, Tadas, Uraiur, Veeranapura, etc.

While dwelling upon the nature and extent of the cultural association of the black-and-red ware with the Jorwe ware in the North Karnataka region Sundara (1968 : p. 12) has observed thus : "..... this pottery is found only in those sites that have the red ware pottery of Jorwe fabric". In other words, 'in the association of a kind of black-and-red painted sherds having affinity with the chalcolithic red ware of Jorwe fabric, the chalcolithic black-and-red ware pottery, occasionally white-painted analogous to that of Tekwada, also occur in most of the sites. Dhulkhed and Urchan are the typical sites (Sundara, 1971 ; 4). He adds : "It should be noted here that the black-and-red vessels along with the Jorwe pottery, are found as burial furniture in many of the chalcolithic sites of the Tapi Valley" (1968 ; 3). Thus, it is clearly akin to that of the chalcolithic burial of Tekwada and of the Chalcolithic Chandoli on the one hand and the burials of Tekkalakota on the other (*Ibid* : 14). He concludes : "Excavations at Tekkalakota and explorations of the chalcolithic sites of the Bhima Valley, have conclusively disclosed the presence of the black-and-red ware in the chalcolithic context in association with the

plain and painted pottery of the Jorwe Fabric" (1972 : 119).

III. Associated Material Equipments

This varied personality has to be considered in terms of associated material equipments, too, with a view to knowing its individuality, if any.

The architectural remains found in association with the black-and-red ware at sites like Lothal (Gujarat), Ahar (Rajasthan), Navdatoli (Madhya Pradesh), Chirand (Bihar), Pandu Rajar Dhibi (West Bengal), Chandoli and Inamgaon (Maharashtra), Tekkalakota (Karnataka), present a totally divergent picture. We do not find any inter-relationship amongst them. A close perusal of the available evidences undubitably reveals that while on the one hand the Harappan black-and-red-ware is associated with well-packed brick structures at Lothal in Gujarat, the black-and-red ware of non-Harappan context at Ahar in Rajasthan, on the other hand, is associated with loosely-laid rubble structures. Still contradictorily enough, it is associated with wattle-and-daub structures at Navdatoli in Madhya Pradesh. While the architecture as obtainable to us at Lothal is truly urban in character, the rickety structures at Chirand present a purely pastoral pattern. Numerous divergences can also be pointed out in respect of other sites yielding black-and-red ware in the chalcolithic context.

In other fields too, total divergence in cultural pattern is distinctly discernible, for instance, whereas at Ahar there are no microliths associated with the black-and-red ware, *per contra* at Navdatoli these are abundantly associated. Again, the microliths associated with the black-and-red ware in the Malwa culture context conspicuously differ from the Deccan Chalcolithic culture. Similarly, the typical Harappan blade industry found in association with the black-and-red ware at Lothal is clearly dissimilar to what is obtainable at Chirand. Thus, it is abundantly clear that this ware does not seem to possess a cultural assemblage of its own.

The fairly large assortment of tools and weapons found in association with the black-and-red ware in the Harappan context at Lothal differ largely with what is obtainable at Ahar, Navdatoli, Chandoli and other sites yielding this ware in the chalcolithic or proto-historic contexts. The copper objects of domestic use, ornaments for personal use and figurines of dog, hare, swan and of a dancing female found at Lothal are too remarkable for their variety and quality. No such things are found at Ahar which is noted for the discovery of black-and-red ware. Thus, it is more than obvious that this ware is totally devoid of cultural components of its own.

A probing of other associated finds reveals that similar divergences can appropriately be pointed out in respect of various objects of gold and silver, terracotta toys, terracotta cult-figurines, beads, burials, flora and fauna unearthed at different sites in the chalcolithic or proto-historic contexts. All these points have been broadly elucidated in the accompanying chart.

IV. Chronological Assignments

The chronological background of this ware is also none-too-less varied as can appreciably be attested to by relative and C-14 dates of these sites, e.g.,

LOTHAL

Maximal date : 2080 ± 135 B.C. (TF-136).

Minimal date : 1810 ± 140 B.C. (TF-19).

AHAR

Maximal date : 1940 ± 95 B.C. (V-58).

Minimal date : 1550 ± 110 B.C. (TF-32).

NAVDATOLI

Maximal date : C. 1600 B.C.

Minimal date : C. 1300 B.C.

CHIRAND

..... : 845 B.C. (TF-334).

PANDU RAJAR DHIBI

..... : 1012 ± 120 B.C. (C-14 date for Period II)

CHANDOLI

Maximal date : C. 1600 B.C.

Minimal date : C. 1440 B.C.

INAMGAON

Maximal date : C. 1000 B.C.

Minimal date : C. 700 B.C.

SONGAON

..... : C. 1000 B.C.

HALLUR

..... : C. 1000 B.C.

TEKKALAKOTA

..... : C. 1400 B.C.

Thus, we notice a blatant diversity in the chronological background, too.

V. Technological Make-up

This varied personality has to be considered in terms of technological differentiations, too.

As pointed above, this ware, besides India, is reported from Ancient Egypt, where it has been described as "black-topped" ware as well as 'Red-and-Black' pottery (*Lucas, 1929, p. 121*) or 'Black-and-Red' ware (*Lucas, 1962 : p. 377*). Basing on the results of experimental examinations conducted by the ceramic chemists and archaeologists alike, various theories have been advanced in respect of the structural aspect, the make-up and the manufacturing processes pertaining to the over-all technological personality of the commonly called 'Black-topped' ware of Ancient Egypt in the extra-Indian context. In the Indian context, too, a few experiments have been carried out but considering the vastness and largeness of the material remains they appear to be too negligible. The Indian archaeologists as well as the archaeologists writing on Indian archaeological activities have mostly repeated the same views and theories as held by others in respect of the 'black-topped' pottery of Ancient Egypt in the extra-Indian context.

In the following pages will first be stated the various views held by the archaeologists and others in the extra-Indian context followed by a summary of the experimental examinations conducted in the Indian context.

EXTRA-INDIAN CONTEXT

In Ancient Egypt, besides the 'black-topped' pottery, there was another ware known as 'Black-ware' characterised by a black interior and black exterior. Results in respect of the blackness of this ware have also been extended to the study of the blackness of the Egyptian black-and-red ware.

Without going into the details, we may only cite the conclusions arrived at by the different scholars in respect of the technological make-up of this ware.

Ayres, J.L. : Dilating on the 'black-ware', Myres (1903 : p. 368) observes : 'what had begun as an accidental disfigurement had been seized and utilized and developed into an intentional technique ?

Scott, Sir Lindsay : Scott (1956 : 383) has to write this : "black ware may result from the reduction of ferric oxide in firing, but it may also be produced by soaking the pot in oil and heating it to a low temperature to carbonize the oil ; or by depositing particles of carbon throughout the fabric by throwing vegetable matter into the kiln at the end of the firing ; or by placing the pot, while still hot from the kiln, in vegetable matter such as chaff".

Randall-Maciver : Randall-Maciver (1905 : 20-2) attributes the blackening of certain pottery in upper Egypt to the 'fierce heat' caused by the addition of chopped straw to the fuel.

Jacquetta Hawkes : This attractive bicolour was secured by standing the inverted pot in ashes that prevented the access of oxygen to the buried portion while the rest of the vessel was exposed (Hawkes, 1963 : p. 304, Fig. 43).

Pollard, W.B. According to Pollard (1912 : pp. 72-76), the black of the Egyptian 'black-topped' ware is a carbon black.

Gordon Childe : 'Egyptian black-topped may contain free carbon'. Prof. Childe (1937 :

p. 44) pleads and adds that attribution of the black or grey colour exclusively to this element is not justified experimentally.

Crowfoot, J.C. : Crowfoot (1925 : p. 131) postulates a process in which the pot direct from the fire and still red-hot is buried in and covered with organic materials to turn its surface black.

Mercer, H.L. : Mercer's (1919 : p. 17) experimental examination involves the application of a wash of red-ochre, polishing off the surface by rubbing and then firing the pot placed in an inverted position with organic materials.

Petrie, Flinders W.M. : Petrie (1910 : pp. 130-131) attributes the blackness to black oxide of iron, and the redness to red oxide of iron, both formed at the same time from the iron compounds present in the clay, the different effects being produced by the vessel having been fired in an inverted position.

Petrie is supported by Franchet, (84-85), Forsdyke, (1914 : 137-139), Frankfort (100 64) and Harrison (1928 : p. 49).

Lucas (1963 : p. 374), however, has something different to say : "That the colour of black pottery", observed Lucas, "may be due to the presence of black oxide of iron produced from red oxide by the action of reducing gases in the fire is theoretically possible and from a chemical point of view is very attractive, but that any such reduction actually occurred during the baking of Egyptian black and black-topped ware has not been proved".

Lucas A. : On the basis of his experimental examinations, Lucas (1962 : p. 380) postulated the possibility of two distinct operations, the first being the making of a red pot (the red of the clay being enhanced in some instances by a wash of red ochre) and the second being the subjecting of the rim and interior of the pot to the action of dense smoke in order to blacken them.

Baumgartel, Dr. Elise, J. : Baumgartel (1955 : 17) seems to support Lucas when he states thus : "We now know that the black top was not made in a single process together with the red body of the pot. A. Lucas has shown by his experiments that for the red pot to acquire its black top a second process was necessary, and that it had to be treated with a special matter, carbon, which is not present in the red slip. Black-topped pottery was thus a development of the polished red ware, and not a less accomplished stage in its manufacture".

INDIAN CONTEXT

In the Indian context, archaeologists have generally believed in what has been described as the 'inverted firing technique' of manufacture. In this technique, the pots are placed in an inverted position in the kiln subjecting the exterior to oxidising conditions and the interior to reducing conditions. Saw dust or some vegetable matter might have been filled in the pot while firing under reducing conditions. As a result, the interior turns black and the exterior dull red to buff in colour.

However, Sankalia and Deo (1969 : pp. 28 and 219), do not rule out the possibility of double firing technique involved in the preparation of the black-and-red ware.

In the Indian context, so far only a few scientific experiments are known. The first by Plenderleith (1930 : 190) pertained only to the Megalithic black-and-red ware. It was directed to the study of the make-up of this Megalithic black-and-red ware. Archaeologi-

cal chemist's examination was confined to the microscopic study of the black-and-red ware of the historical period (*Wheeler, 1946 : 50-93*). Mujumdar's experimental examination, of course, studied this ware in all its ramifications, i.e., the make-up, the structural aspect and the manufacturing process. Wakankar (*1967 : 7*) claims to have experimented the production of such pots.

Mujumdar, G. G. : Results of Mujumdar's (1969 : 92 : Ramachandran, 1971 : 113) experimental examination are as under :

- (a) Single firing ; or,
- (b) Double firing when the pot is fired red first and after subjecting it to special arrangement and refiring it when the part protected by this special arrangement becomes black (Lucas's idea of Egyptian firing technique) ; or,
- (c) Double firing but this time firing the pot black first and refiring it (with special arrangement) when a portion becomes red.

According to Mujumdar (*1969 : 93*), the Megalithic Black-and-Red ware was more likely to have been produced by the last method, i.e., (c) Black-and-Grey might be due to some unfavourable position or condition of the pot (*1969 : 93* ; *Ramachandran, 1971 : p. 113*).

Besides the afore-mentioned experimental examination, Mujumdar (*1971 : 85*) had also conducted a Megascopic and Microscopic study of the sherds of the chalcolithic black-and-red ware from Chalcolithic Navdatoli, which revealed the fact that the "ware is most probably a result of single firing under simultaneous reduction/oxidation conditions".

Thus, we find that the technological personality also of this ware is poignantly diverse for divergent views have been expounded in respect of its technological make-up, for example, inverted, single and/or double firing technique of manufacture. There may be still more complex methods of its manufacture which, however, are not firmly tested. This shows a changing technological personality of the black-and-red ware.

VI. Typological Personality

Ut Supra, varied cultural association and the possibility of different technological processes have given this ware unique importance in Indian archaeology. This has, however, to be supplemented by a study of typology, for typology too appears to be varied as for instance, at Lothal, Rangpur, Ahar, Navdatoli, Surkotada, etc. The excavator (*Rao 1963 : 108*) of the sites of Lothal and Rangpur has to observe thus : "Though the technique of inverted firing is the same at all the sites where the black-and-red ware vessels occur, the shapes of vessels vary from site to site, but they closely follow the shapes in other wares of a given site". He (*Ibid : 108*) reiterates : "the shapes of the vessels are similar to those of the major ceramic wares of a particular period to which the black-and-red ware belongs. This fact is fully borne out at Lothal and Rangpur". At the latter site, we notice that the shapes of black-and-red ware draw close parallels with the vessels of the Micaceous Red ware. In fact, the same shapes occur in both the wares (*IAR, 1956-57 : 15*). Thus, we find that this ware is devoid of any fossilized shape.

In respect of nature of paintings also variation is distinctly noticeable. As observed by Rao (*1961 : 21*), the vessels at Lothal are painted in white over black only in the

interior, while the Megalithic Black-and-Red ware and Chalcolithic Black-and-Red ware of the Ghaggar Valley and Central India are painted on both the surfaces or the exterior only.

At Rangpur, too, there is hardly any difference between the black-and-red ware and the Lustrous Red ware vessels in form or treatment of the surface, except in the technique of firing (*Rao, 1963 : 17*).

According to Rao, (1963 p. 108), the black-and-red ware was the result of a variation in the technique of firing ; pots of the same shape and fabric were subjected to two different techniques of firing at Lothal and Rangpur, resulting in the red ware and black-and red ware (*Ibid : 108, fig. 15, types 6-10a*). Thus, we find that the slightly convex-sided bowl of black-and-red ware closely resembles the convex-sided bowl in the red ware in sub-period IIA of Rangpur (*Ibid : 61 108, fig. 15, types 5 and 5a*). In Sub-period IIB of Rangpur, it developed straight sides, closely following the bowls in the red ware (*Ibid : 61 & 108, fig. 31, types 63-64*). Both, however, developed simultaneously a concavo-convex profile with a blunt-carinated shoulder in Sub-period IIC and a deep carinated shoulder in Period II (*Ibid : 61, 108 and 109, fig. 31, types 11 and 13*).

Also, the ceramic shapes noticed in the Micaceous red ware are repeated in the black-and-red ware (*Ibid. : 61*). The main shapes of both these wares are the convex-sided bowl, the bowl with a stud-handle and the small jar with a bulbous body (*Ibid : 61*).

Thus, we find that the shapes of the vessels in black-and-red ware closely follow those of the Lustrous red ware as well as the Micaceous Red Ware (*Ibid : 61*). As observed by the excavator, it is, therefore, quite evident that pots of the same form could be subjected to two different techniques of firing, producing red ware or the black-and-red ware depending, of course, upon the condition of firing (*Ibid. : 61, fig. 15*). The excavator continues further by adding that at Lothal, too, the identity of shapes, in the Micaceous red ware and the black-and-red ware vessels is a noteworthy feature (*Ibid : 61*). The small necked jar, according to him, is a typical Harappan shape occurring in the sturdy fabric, black-and-red ware and the Micaceous red ware (*Ibid. : 61, fig. 15, type 1a*). As a matter of fact, at every stage of evolution of the ceramic types in the red ware, especially the Micaceous red vessels, almost a corresponding evolution in the black-and-red ware vessels can be noticed (*Ibid. : 97, fig. 15*).

Basing his observations on the data as available from Lothal, Rangpur and Ahar, Rao has pointed out a few contradictions in respect of black-and-red ware pots from these sites which may be briefly stated as below :

- i) The black-and-red ware from Lothal is noted for its simple forms, such as the bowl with an incurved or slightly-everted rim or with stud-handle. The bowl from the early levels of Ahar IA is beaded below the rim which is sometimes prominently everted ; a flange occurs on the exterior in the absence of any beading (*Ibid. : 109*).
- ii) The painting is executed in white on both the surfaces of the Ahar vessels, with simple dots between parallel lines, spirals, etc. ; the zonal conception in painting is a remarkable feature of Ahar, which, however, is not to be found on the black-and-red ware of Lothal (*Ibid. : 109*).
- (iii) On the other hand, the Lothal designs are elementary, *viz.*, sokes and wavy lines ; the painting is confined to the interior of the vessels, whereas at Ahar it is done on both surfaces or the exterior only ; intricate designs such as lozenges juxtaposed to

each other enclosing spirals between them are introduced in the late levels of Ahar IA (*Ibid* : 109).

Evidences from Surkotada also show that the ware overlaps with the shapes of the associated Harappan Red ware.

At Ahar, the ware again overlaps with the shapes of the associated wares. For example, bowl with carination in Burnished Grey ware is stated to be comparable to Type I in black-and-red ware (*Sankalia et al*, 1969:46); Type 3a, Type 5 and Type 1 of the black-and-red ware also occur in the Black burnished ware (*Ibid* : p.39). Fabric 5 of Red-slipped metallic ware of Red ware group is similar to Type 1 of the black-and-red ware (*Ibid* : p.61). The stepped dish and stems of three types of black-and-red ware of Phase Ib of Ahar seem to be an imitation of the Tan and Chocolate metallic ware (*Ibid* : p. 25). Certain few shapes of Thin red-slipped ware are also comparable to black-and-red ware, particularly the rimless bowl (*IAR*, 1959-60: p41).

Rao also finds a "certain difference" between the black-and-red wares of Ahar and Lothal. The observations made by him in the case of the black-and-red ware of Lothal A and B apply to those from Rangpur IIA and IIB also (*Rao*, 1963: p. 199).

At Gilund again the shapes in black-and-red ware are found to parallel the shapes of the Black-ware (*IAR*, 1959-60:41).

The black-and-red ware of Period II of Noh is stated to be different from the one found from Ahar and Navdatoli (*Srivastava*, 1969:39). As a matter of fact, the black-and-red pottery of Period II of Noh is not a slavish imitation of black-and-red ware from the Harappan sites or the chalcolithic sites of Ahar, Navdatoli, etc. (*Ibid* : 40). Agrawal (1972:4) also affirms thus : ". . . the shapes of unpainted black-and-red ware, Pre-P.G.W. levels at Noh, are quite different from those of black-and-red from Ahar".

Further, the black-and-red ware is reported to show a striking closeness in shapes to those of the Painted Grey ware. As observed by the explorer, in the north-eastern zone of the Ahar Culture, the shapes in the black-and-red ware acquire a fair nearness to the shapes in the Painted Grey Ware. In the words of the explorer (*Misra*, 1967:207 *IAR*, 1958-59:45), they "tend towards those of the Painted Grey Ware", e.g.,

Amli	(District Bhilwara)
Bihara	(" ")
Kotri	(" ")
Pander	(" ")
Banthali	(" ")
Lank	(District Tonk)
Naner	(" ")
Deopura	(" ")
Ram Kishan Pur	(" ")
Chosla	(District Ajmer)
Samelia	(" ")
Gondi	(District Jaipur)

The story of overlap in shapes does not cease here. At Atranjikhera, too, during

Period III the Painted Grey ware and the plain grey ware, according to the excavator, show a remarkable resemblance in shape to the black-and-red ware (*Gaur, 1965 : pp. 144-145*). However, a marked dissimilarity in shape is discernible between the black-and-red wares of Atranjikheda on one hand and Ahar on the other (*Sankalia et al, 1969:221*). As a matter of fact, most of the shapes of this ware are found to be different from those obtained from the other sites of chalcolithic assemblage yielding the black-and-red ware (*IAR, 1963-64: p.47*).

Besides Atranjikheda, at Khalua also, lying between Atranjikheda and Noh, commonness in shape between the Painted Grey Ware and the black-and-red ware is noted by the excavators (*IAR, 1965-66:42*).

According to the excavators of the site of Kaseri also, the bowls and dishes in the black-and-red ware have a typological connection with the Painted Grey Ware (*Dikshit, 1970*).

In the words of one of the excavators, (*Verma, 1969:103*), there is "a vast difference in the pottery types of Chirand and Sonepur". According to him, "types like dish-on-stand, footed bowl, spout, jug, *lota*, etc. are absent at Sonepur whereas at Chirand they have been found in good numbers" (*Ibid. :103*).

According to K. K. Sinha, the 'painted tradition on the black-and-red ware at Chirand is different from Ahar and other Central Indian sites' (*Ibid. : 109, Comments*).

At Navdatoli, amongst the painted bowls of Painted Red Ware, the (a) Hemispherical, (b) Ovaloid, and (c) Sub-ovaloid shapes are found in painted black-and-red ware (*Sankalia et al, 1958:92*).

The various bowl-shapes or types in the black-and-red ware with paintings in white, in fact, largely copy or imitate the forms in Malwa ware (*Sankalia et al, 1971: 1074-113*) of Black-on-Red ware types (*Ibid. : 87 and 105*). The discovery of two sherds of the bases of goblets indicate that the black-and-red ware goblets have longer stems as in the Black-on-Red ware (*Ibid. : 98, Fig. 32-14, Fig. 32-15*).

Thus, the black-and-red ware bowl and other forms either imitate those in the Black-on-Red and Cream-slipped wares, or show a parallel development (*Ibid. : 80*).

Except a solitary vague resemblance with a Rangpur bowl, the black-and-red ware of Navdatoli is otherwise different in treatment of surface and forms from the black-and-red ware of Rangpur (*Reo, 1963:168*). The Navdatoli black-and-red ware is black or grey on the interior and slightly reddish below the rim on the exterior, whereas in Rangpur IIC and Rangpur III the exterior of the vessel is lustrous red and the interior black and shining (*Ibid. : 198*). Most of the Rangpur bowls have a carinated shoulder in Period IIC and III (*Ibid. : 198*).

Ahar has yielded many more shapes and designs; on the contrary, those at Navdatoli exhibit shapes which are not represented at Ahar (*Sankalia et al, 1971:187*). As observed by the excavators. (*Ibid. : 68 and 105*), the black-and-red ware from Ahar and Navdatoli seemed to be "superficially similar" but both "differed in type, shape and surface decoration".

Navdatoli types in black-and-red ware are quite different from those of Atranjikheda types in black-and-red ware, too (*Ibid. : 105*). The latter has comparatively large bowls with straight outgoing sides, and the fabric, as all the Gangetic fabricis, also much finer (*Ibid. : 105*). Navdatoli has smaller, more delicately made bowls (*Ibid. : 105*).

The channel-spouted vase, which is the characteristic type of the black-painted

red ware of the Malwa fabric, is reported to occur in the black-and-red ware, too, at Eran (*IAR*, 1963-64:15-16; Singh, 1967:22).

It has been observed by the excavators that the black-and-red ware of Songaon is totally different in fabric and types from the black-and-red ware of the Proto-historic period at Ahar and Navdatoli (*Deo et al.*, 1969 : 544).

From the foregoing survey, it is fairly obvious that the black-and-red ware does not seem to possess any typological personality of its own.

VIII. Conclusion

From the above review of material equipments—associated with the black-and-red ware in the contexts of Harappa Culture in Gujarat, the Copper-Age Culture (Banas Culture) in South-eastern Rajasthan, and the Chalcolithic cultures of Central India, Bihar, Eastern India, Deccan and Northern Karnataka—compounded by the foregoing examination of the chronological assignments, technological distinctions and typological contradictions carried by the black-and-red ware, it is amply evident that this ware does not seem to possess a cultural personality of its own.

Moreover, in the context of the black-and-red ware we do not find any cogent and tangible inter-relationship also amongst these chalcolithic or proto historic cultures of India. The culture as known to us from Lothal is extensively divergent from that noticeable at Ahar. Again the Harappan Culture of Lothal, Rangpur, Surkotada and other related sites of Gujarat is conspicuously different in conception as compared to the chalcolithic cultures of Navdatoli and other adjoining sites of Central India. Further, the chalcolithic cultures of the Deccan and Northern Karnataka are convincingly materially dissimilar to what is obtainable at Chirand and Sonepur in Bihar, and Mahisdal and Pandu Rajar Dhibi in West Bengal. Thus, we notice a blatant sparsity of inter-relationship amongst the different cultures carrying with them the black-and-red ware.

Finally, it would thus appear that inspite of the wide range in space and time, the black-and-red ware does not seem to represent a cultural personality of its own as can aptly be stated in the case of Indus, Malwa and Jorwe wares.

MAIN SITES OF BLACK-AND-RED

	LOTHAL	AHAR	NAVDATOLI	CHIRAND
STRUCTURES	Brick structures ; Harappan pattern.	Structures of undressed blocks of schist-and-mud.	Wattle-and-daub structures.	Mud-and-bamboo structures.
POTTERY SHAPES	Harappan shapes.	Convex-sided bowls ; acutely-carinated bowls ; bowls-on-stand ; stepped dishes ; ribbed pots ; beaker.	Carinated bowls ; goblets ; basins.	Lipped bowls ; dish-on-stand ; through ; lots long-necked jar.
COPPER TOOLS	Tanged arrow-head ; spearhead without a mid-rib ; dagger ; axe ; celt ; chisel ; drill ; saw ; knife ; razor ; workshops.	Celt/axe.	Sword or dagger with a mid-rib ; arrowhead ; celt/axe ; chisel ; nail-parer ; point-cum-engraver ; poker.	No evidence
MICROLITHS	Long parallel-sided blades ; short parallel sided blades ; chert ; jasper ; agate ; Local industry.	No evidence.	Short blade industry ; chalcedony ; agate ; carnelian ; quartz ; jasper.	Microliths including cores and flakes.
T.C. TOYS	Bull ; horse ; ram ; rhinoceros.	Bull ; horse ; elephant.	Bull ; horse.	No evidence.
T.C. CULT. FIGURINES	Mother-goddess (?)	Mother-goddess(?)	Mother-goddess (?)	Absent
BEADS	Etched carnelian ; steatite ; agate ; jasper ; faience ; ivory ; Metal ; Harappan shapes ; workshops.	Etched carnelian ; faience ; jasper ; agate ; lapis ; steatite ; decorated terracotta beads, parallels from Anau, chanhudaro ; metal.	Agate ; amazonite ; carnelian ; chalcedony ; type bead faience ; jasper ; lapis ; paste sandstone ; shell ; steatite ; terracotta ; and metal with varied shapes.	No Harappan industry.
FLORA BURIALS	Extended-burial ; double-burial ; Urn-burial (?)	Absent	Absent	Absent
FAUNA	Rice (?)	Rice ; Jwari (?)	Wheat ; rice ; lentil ; black gram ; green gram ; Linseed.	No evidence
	Elephant ; Cattle.	Cattle.	Horse (?) ; cattle.	Cattle.

WARE AND SIGNIFICANT ASSOCIATIONS

PANDU RAJAR DHIBI	CHANDOLI	INAMGAON	TEKKALAKOTA
Mud-plastered-reed-screen structures.	Structures of mud-walls, bamboo-screens and wooden-posts.	Mud-plastered reed-screen structures.	Mud-plastered bamboo-screen structures.
Channel-spouted bowl; lipped bowl; inverted-helmet shaped vase ; trumpet shaped basin; conical basin with perforations	Carinated bowls ; rimless bowls.	Bowl ;	Bowl ; dish.
Nail-parer.	Dagger with an antennae-end ; celt/axe ; chisel	Poker ; tong.	Poker.
Stone blade industry of debased form.	Microlithic and blade industry ; chalcedony ; agate ; jasper ; carnelian.	Blade industry.	Blade ; flake and microlithic industry ; chert ; chalcedony ; opal ; Local industry.
No evidence.	Theriomorphic bull, parallels from Nevasa ; Mohenjo-daro ; Tepe Giyan ; Crete ; Egypt ; Anatolia ; Syria and Mesopotamia.	Bull ; horse.	Bull.
Absent	Absent	Male-god ; Mother-goddess.	Absent
Beads of copper, semi-gemstones and other materials.	Faience absent ; star-beads ; collared barrels ; discs ; real bicones ; spacer beads ; and pendants absent.	Beads of semi-precious stones, ivory and shell ; local-manufacture.	Beads of carnelian ; steatite ; green stone and shell.
Urn-burial ; extended-burial ; fractional-burial.	Open-burial ; extended burial ; Urn-burial ; preponderance of Urn-burials.	Extended burial ; Urn-burial : located within the houses.	Urn-burial ; extended-burial ; pot-burial ; children buried under the floors.
Rice.	Flax	Wheat ; lentil ; Jowar ; rice (?)	Kulath (?) ; Data-palm (?)
Cattle.	Cattle.	Cattle.	Cattle.

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4

The Ochre Coloured Ware Settlements in Ganga-Yamuna Doab

19

K. N. DIKSHIT

THE GANGA-YAMUNA Doab, a part of ancient *Madhyadesa*, is a densely populated northern region of the country. It is approachable from Delhi and Punjab after crossing Yamuna and also from Tibet via Timli pass. In earlier times the area was also part of the 'Antarvedi'. The river Ganga is formed of two tributaries, the Bhagirathi and the Alaknanda. The Junction of these rivers is called Dev Prayag. After crossing it, the combined river known as Ganga enters into the Siwalik Ranges of Dehra Dun and Hardwar. The Yamuna joins Tons behind the Mussoorie Hills and then emerges into plains, where it flows in a broad curve by Delhi, Mathura and Agra to join the Ganga at Allahabad.

The excavations at Rajpur parsu and Bisauli (*Lal, 1951*) brought to light for the first time the settlements of Ochre Coloured pottery users, one of the earliest settlers of this region. Their pottery was also noticed in the lowest levels of *Hastinapur* (*Lal, 1955*) and *Atranjikheda* (*Gaur, 1969*). At Bahadarpur it was found at a place near which a Copper-Hoard was found sometime earlier (*Sharma, Y. D. 1961*). At Saipai, however, Ochre Coloured pottery and Copper-Hoards were found together in regular excavations (*Lal, 1971-72*). Outside Doab, the settlements of these people were noticed in the excavations at Noh and Jodhpura in Rajasthan (*Agrawal and Vijay Kumar, 1976*). It was further picked up from Katpalon in Punjab (*Dikshit 1967*) and Baharia, Shahjahanpur District (fig. 1) in the east (*Sharma G.R. 1671-72*).

The Problem

The Ochre Coloured pottery (O.C.P.) has often been described as ill-fired, worn and rolled in appearance. The slip usually gets separated when the pottery is extricated from the earth and the ochrous powder comes off even if slightly rubbed. Scientific researches are going on to know about the factors responsible for making this pottery so worn out or rolled in appearance. Was it due to wind activity, prolonged exposure, water-logging or location of these settlements in flood plains of the rivers or due to some other reasons?

Pattern of Settlements

The settlements of O.C.P. people are generally very small (200×200 m) and therefore appear to be of short duration. The occupational thickness varies from 0.30m to 1.20 m (*Shanker Nath, 1971-72*). At many places these settlements are located just on the river-banks. Exploration of these sites is often very difficult since they are usually flat on surface, sometimes due to ploughing and other times due to silting. It may also be mentioned that in the upper Ganga valley where an extensive survey has been attempted, these settlements were found located at a distance of about 5 to 8 kms from each other. In the area of Saharanpur District located in the Yamuna valley, the distance between one settlement and the other is further reduced ranging between 4 to 6kms. Obviously the area was thickly populated.

The settlements of Hastinapur, Ambkheri, Gadharona, Thataula and other sites are situated on the top of older alluvium (Bhangar) along the old bank of the river Ganga, called Buddhi Ganga. The newly discovered sites from Ambkheri (*Deshpande, 1965*) upto Hardwar are also found along the old course of the river. It is significant to note that they are littered with small split-pebbles. The older alluvium, which is rather dark coloured and generally rich in concretions and nodules of impure calcium carbonate, forms slightly elevated terraces, generally above the flood levels, the river having cut through it to a lower level (*Krishnan, 1960*). The river Ganga has now shifted its course by about 22 kms. further east.

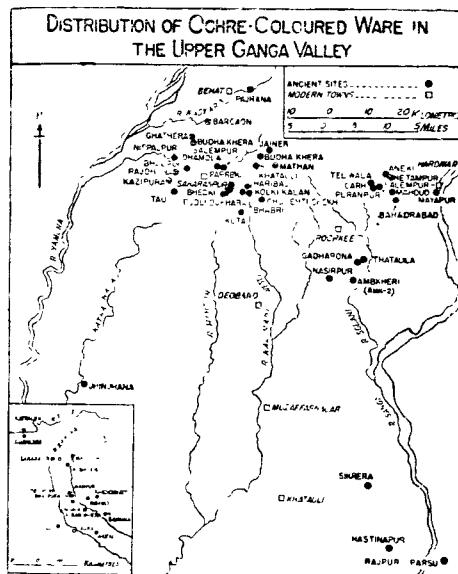


Fig. 1 : Distribution map of OCP in the upper Ganga valley.

Distribution

The O.C.P. settlements have generally been grouped as under (*Dikshit, 1971-72 and 1973*) :

Central Doab

The Central Doab comprises the Districts of Shahjahanpur, Bareilly, Etawah, Etah and partly Bulandshahr. The excavated sites of this area are as follows:

(i) Baharia, District Shahjahanpur

Details of this site have not been published except, for a notice The occupational

deposit of about 0.92 m mixed up with dark brownish clay merges imperceptibly with the natural soil. Only the variants of jars in ochrous fabric with horizontally splayed out or out-turned and externally beaded rims were encountered in the dig.

Another site in this region is located at Nurpur but it is doubtful if O.C.P. was ever picked up from this place. The pottery types which have been claimed similar to O. C. P. show paintings on the red surface and needs fresh study.

(ii) *Saipai, District Etawah*

The discovery of the Ochre-Coloured pottery from Saipai in association with a harpoon, typically representative of the Copper-Hoards in regular excavation, has been a significant discovery in Indian archaeology. However,

the pottery types are limited. (fig. 2) Only the variants of jars and basins with horizontally splayed out rims or bowls with internally bevelled rim, handled pots, etc. were found. Incised and painted pottery was also noticed.

(iii) *Ahichchhatra, District Bareilly*

The Ochre-Coloured pottery deposit, which is about 0.60 m is compact, clayey and hard (*IAR, 1963-64*). The pottery types are dishes-on-stand (?), jars with flaring rim, bowls with a slightly everted rim, basins with a thickened and protruding rim and spouted vessels.

(iv) *Atranjikhera, District Etah*

The occupational deposit is ranging in thickness from 0.80 to 1.50 m. The pottery types revealed besides usual jars, bowls and basins, channel-like-spouted below the rim of bowls, handled pots and painted and incised decorated sherds (*Gaur and Hasan 1964*) (fig. 3)

(v) *Lal Qila, District Bulandshahar*

The excavations revealed large storage jars, vases, lids, bowls, handled pots, miniature pots and incised sherds, (fig. 4). Besides pottery, terracotta female figurines, bangles, beads, bone-points and arrow-heads were also found. Architectural remains in the form of mud-structures were also noticed (*Gaur, 1970-71*).

The exploratory assemblage of Manpura and Bhatpura, both located in Bulandshahr

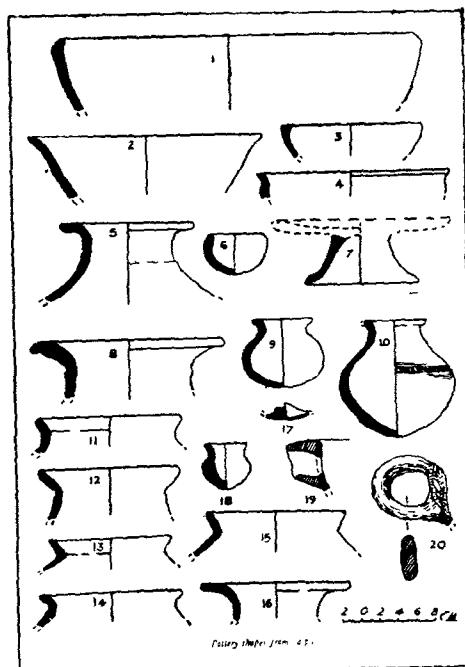


Fig. 2

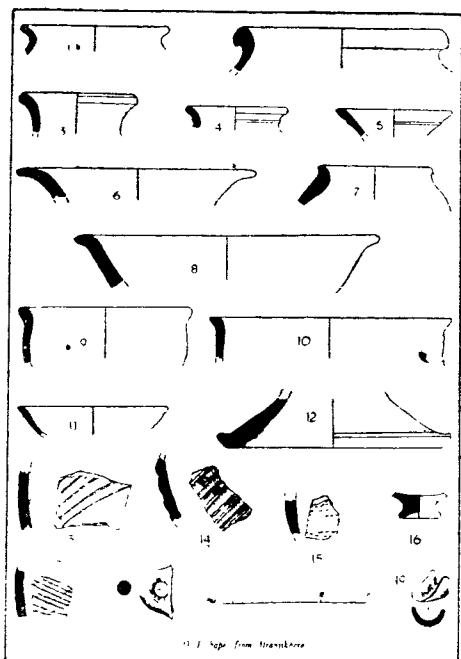


Fig. 3

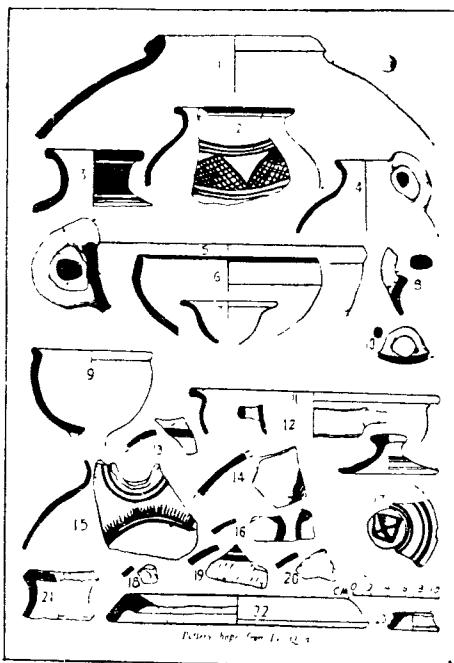


Fig. 4

District can be also correlated with Lal Qila assemblage on the basis of the occurrence of incised and painted sherds etc.

The Ochre-Coloured pottery culture-complex of Central Doab has a few common incised designs, painted sherds and limited pottery types, including channel-like spout and handled pots. In excavated sections regular habitational layers were not noticed. A random distribution of sherds was noticed in the O.C.P. strata which is not easily distinguishable from the natural soil.

Upper Doab

The Ochre Coloured pottery sites of this area are located in the districts of Saharanpur, Bijnore, Muzaffarnagar, Meerut and partly Bulandshahr. The pot sherds encountered in the excavations from the hard deposit of brown earth at Bisauli, Rajpur Parsu and Hastinapur do not provide any particular shape of the pots except for the jars with slightly splayed-out rims. The frequency of sherds is very limited. However, at Bisauli a painted pottery was also found mixed up in excavations. The nature of this pottery has yet to be determined.

(i) Kaseri Meerut District

The thickness of the occupational strata is 0.50 m. There is no visible difference in the natural soil and the Ochre-Coloured pottery strata except that the latter has yielded some pot-sherds. These sherds, however, do not provide any particular shape, except for a type of jar with slightly splayed out or beaded rims (*IAR*, 1969-70).

(iii) Ambkheri, Saharanpur District

The excavations at Ambkheri (*Deshpande, 1915 and 1977*) revealed an occupational thickness of about 1.25 m divided into five layers. It is significant to note that the difference between one layer and another is hard to judge after the moisture is evaporated. One floor level, at a depth of 0.60 m. with a hearth was an important discovery. Besides pottery, terracotta animal figurines, cart-wheels with central-hub, terracotta and carnelian beads and stone pestles were also found (fig. 5).

The scrapings at Gadharona and Nasirpur also revealed Ambkheri culture complex. A complete dish-on-stand (with a short stem) was noticed at a depth of 0.45 m. from the surface. At Nasirpur, the O.C.P. sherds were found sporadically upto a depth of 1.50 m. below the present surface (*IAR, 1963-64*).

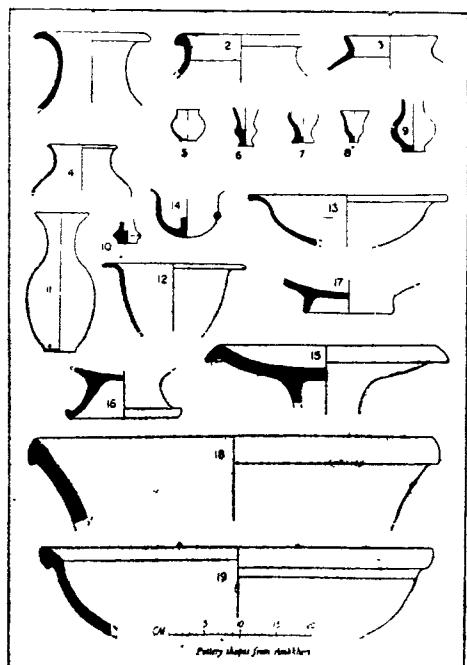


Fig. 5

(ii) Jhinjhana, Muzaffarnagar District

The scraping of the mound at Jhinjhana revealed from the lowest strata which is 0.60 m. in thickness, O.C.P. sherds lying random in section. The types collected are very limited. No painted sherd was found (*IAR, 1962-63*)

(iv) Bahadarabad, Saharanpur District

The occupational thickness of this ware at Bahadarabad is about 0.60 m. The pottery was extricated from wet and sticky lumps of hard brownish earth. The types, dishes-on-stand, basins, with heavily beaded and undercut rim, small ring-stands, bowl or dish with splayed out rim were recovered (*Sharma G.R. 1971-72*) (fig. 6-7).

The culture-complex of Upper Doab, therefore, consists of a variety of utilitarian pottery types, terracotta and carnelian beads, animal figurines and stone objects. It may be noted that painted and incised sherds noticed in Central Doab, were not present in this region.

O.C.P. Settlements outside Doab**RAJASTHAN**

In Rajasthan excavations at Noh revealed for the first time the occurrence of O.C.P. in the lowest level. It may be emphasized that O.C.P. was an important ceramic

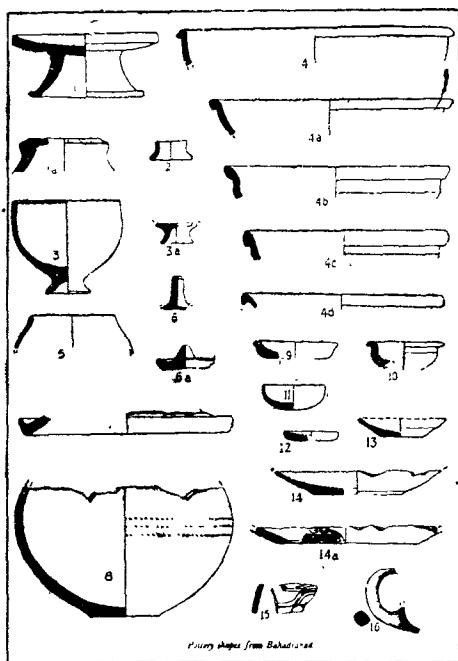


Fig. 6

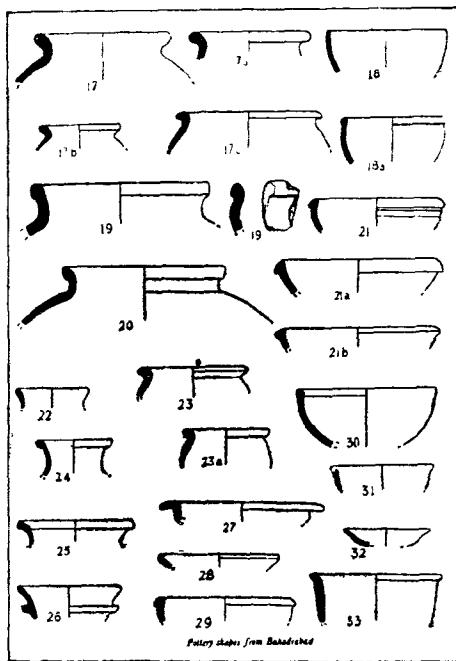


Fig. 7

industry in the south-eastern part of Rajasthan. In systematic explorations on river Sahibi, a tributary of the Yamuna, at least forty sites have been brought to light. A hoard of Copper Celts in association with O.C.P. was also found at Nandalalpura (*Vijay Kumar, 1977*).

(i) Noh, Bharatpur District

The occupational thickness of the O.C.P. deposit is 0.90 m. (*IAR, 1963-64*). It is brownish in appearance. The sherds which are orange to deep red in colour consist of handled pots, vases, basin and bowl. The incised and applique decorated sherds were also found. The incised decoration is similar to that of Atranjikhera.

(ii) Jodhpura, Jaipur District

The O.C.P. deposit at this site is ranging from 1 to 2.10 metres. The deposit is free from water effect and other types of disturbances. The excavators of the site outlined four successive phases of O.C.P. In phase IA, pot sherds are of indeterminate types, whereas in IB, a few shapes could be determined. It includes handled pots, vases, basins and bowls. In phase IC, besides pottery which is in greater density (including incised ones), floors of rammed earth were also noticed. The last phase (ID) revealed a variety of shapes such as storage jars, miniature pots, vases, basins, bowls and lids. The sherds having incised and applique decorations and paintings were also found. Besides pottery, terracotta beads and cakes, stone beads and bone-spikes were also encountered. A mud-brick structure was also noticed (sizes of bricks range from 0.18 to 0.30 m. in length).

× 0.11 to 0.26 m. in breadth and 0.6 to 0.7 m in thickness). These bricks were laid in two courses and joined together with mud motar (*Vijay Kumar, 1977*).

PUNJAB

Sporadic explorations in the upper reaches of the Saraswati and Sutlej valleys also revealed a few O.C.P. settlements.

Sarangour, Chandigarh District

The occupational deposit various from 1 to 1.50 m. The surface appearance, fabric and typology of this pottery are not different from those observed in the Ochre Coloured pottery of the Ganga plains except for certain regional features. Handled pots and incised pottery are also available.

The use of sun-dried bricks, prepared out of moulds for construction purposes, is also attested from a manufacturing area. Besides pottery, saddle squerns and pestles of stone, terracotta bangles and a fragmentary animal figurine are other objects noticed from this place (*Suraj Bhan, 1967*).

Fabric

The clay used for this pottery was uniformly well-levigated but the firing was not adequate and hence most of the pot-sherds have a grey core and dull red appearance. The pots were invariably given a wash or slip. In some cases the slip is quite thick.

The presence of a grey ware in thick, medium and thin fabric in the O.C.P. complex particularly at Ambkheri, Gadharon etc. is significant to note. This pottery is also ill-fired as the grey stuff sticks to the hand. The shapes are limited and consist of basins, jars and miniature pedestalled cups (*Dikshit, 1973*).

Main Types

A few important types found in the different excavations are as under:

1. Jar with a horizontally splayed out rim. (Saipai, Lal Qila, Ambkheri).
2. Basin with a splayed out beaked rim. (Ambkheri and Lal Qila).
3. Storage jar with a slightly beaded rim. (Ambkheri).
4. Bowl-like-lid with central knob. (Ambkheri).
5. Bowl with an everted rim. (Atranjikhera, Lal Qila and Ambkheri).
6. Ring—stand (Ambkheri).
7. Dish of a dish-on-stand with a drooping rim (Ambkheri and Bahadarabad).
8. Flask (Ambkheri).
9. Channel-like-spout (Atranjikhera, Ahichchhatra and Saipai).
10. Handled pots (Lal Qila, Atranjikhera and Saipai).
11. Miniature pots (Jhinjhana and Ambkheri).

The types mentioned from 1 to 7 are also found at the Harappan sites of this region. But there the slip is intact. The variant of type 8 has also been reported from Bhagwan-pura, a late Harappan site in Haryana.

Ochre Coloured Pottery And Harappans

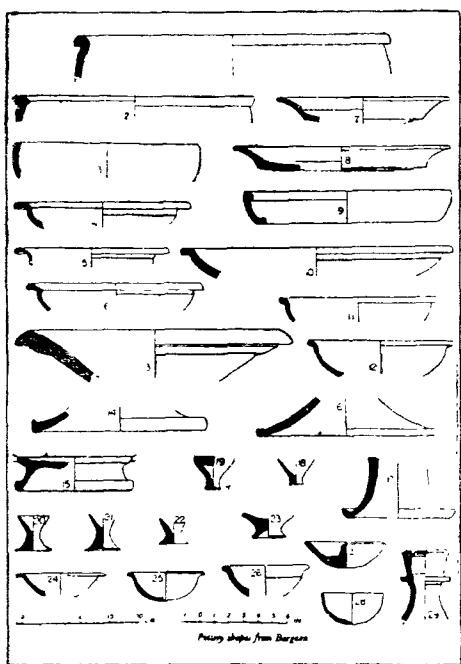


Fig. 8

Doab, on the other hand do not show even this much of typological similarity. The typical compartmented incised designs noticed at Atranjikhera and Lal Qila have, however, a close resemblance with those found at Bara. It is, therefore, at the moment enigmatic. It appears that decorative patterns of this kind went into the general fund of decorations of the people of this region and most of the people drew from it. It means, this similarity does not postulate any direct contact between the Central Doabians and the Bara People living at Bara.

The Ochre Coloured pottery types, such as dish-on-stand with drooping rim, basin, hollow-lid with central knob and large storage jars noticed in Upper Doab are having typological similarity with the Harappan assemblage (including Bara) found in this region. It may, however, be clarified that except for pottery no other culture-type of the Harappans such as the chert blades, agate weights, bangles of faience, beads of steatite, copper or bronze objects and burnt bricks were noticed in the O.C.P. settlements of this region. The typological similarity in pottery in Upper Doab will of course suggest some kind of culture contact between O.C.P. people and Harappans. From this angle the excavated pottery from Bargaon calls for very close study. (fig. 8-9).

The pottery types of O.C.P. in Central

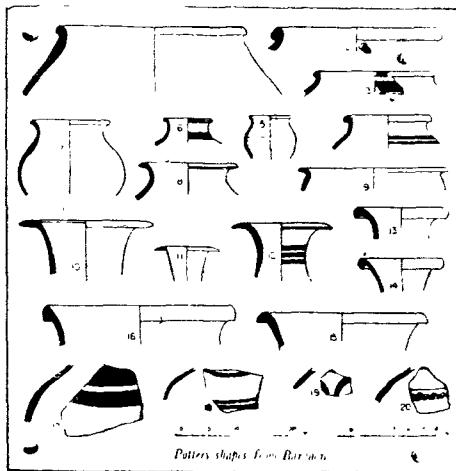


Fig. 9

Ochre Coloured Pottery And Copper-Hoards

The authorship and age of Copper-Hoards is still enigmatic, although in Doab both have been reported together in excavations at Saipai. Most of the finds which are chance discoveries are unstratified and unassociated with any other cultural trait. In Doab, Copper-Hoard specimens are represented by the anthropomorphic figures, the antennae swords, lugged spear-heads and the barbed harpoons, beside other common types such

as flat-celts and bangles. In recent years several metallographic analyses of the Copper-Hoard objects revealed that in alloying techniques these people stand as a distinct class, different from the Harappans and other chalcolithic peoples. They did not use could work and annealing although they knew closed-cast techniques with pure copper. But they knew how to produce bronze as is evidenced from the analysis of a number of tools (*Gupta, 1963*). The Copper-Hoards are required to be studied further from technoiogical angle (*Agrawal, D.P. 1971*).

Recent field work in Rajasthan, Haryana, Madhya Pradesh and eastern India has provided some new material forcing a reassessment of earlier theories. The attempt to put all the copper objects without any regard to close analysis under the title of Copper-Hoards is not sound. In Rajasthan copper celts have been reported with Ahar pottery at Jalore (*Agrawal R.C. 1977*). The association of Sabarniya and Khurdi hoards with the other-Pre-Harappan Harappan or Chalcolithic culture in northern and western Rajasthan has yet to be established. At Mitathal in Haryana, a copper harpoon was found on the surface. Only circumstantially it can be co-related with late Harappan deposit of the site. In eastern India again a copper celt was found in the excavations at Mahishdal, West Bengal, from the painted black-and-red ware complex. But celts and bangles are often of generalized kinds and not very helpful in the scientific study of problem of Copper-Hoards, unless found along with characteristic Copper-Hoard types.

As such the overall age of the Copper-Hoard is difficult to assign. In Doab, however, these types are assigned the date of the Ochre-Coloured pottery.

Geochronological Study

The soil samples from O.C.P. horizons exposed at Ahichchhatra, Bargaon, Hastinapur, Nasirpur and Jhinjhana were subjected to scientific analysis, in order to know the mechanism of transportation and deposition of the material constituting these strata. The investigation indicated the effect of wind on transportation and effect of water in sedimentation of the material constituting these strata. The investigation was further extended to the sites of Ambkheri and Atranjikhera (*Gaur and Haasan, 1964; Lal, 1968; Lal, Dr. 1971-72; Deshpande, 1971-72; Dikshit, 1973; Sharma R.P., 1977*). The O.C.P. deposit of Atranjikhera according to one view has, however, no coarse sand or flood loam, a characteristic feature of fluvialite deposit. Similarly, the O. C. P. deposits at Atranjikhera, Jhinjhana, Bargaon, Ambkheri, Nasirpur and Ahichchhatra have been found to be megascopically structureless and homogenous without any signs of lamination or stratification. In view of the freedom of the O.C.P. strata from bedding-planes, current bedding and ripple marks and the excellent sorting of the material, it seems probable that the O.C.P. deposits were formed on account of wind activity. This also explains the random distribution of this ware in the sections. The situation is, of course, controversial.

Economy

Though, in the absence of the pollen analysis, the study of degraissant material used in pottery making and agricultural implements, it cannot be said that they practised agriculture, yet, from the evidence of overwhelming types of pottery, and, other indus-

trial articles, it may be tentatively assumed that they practised incipient agriculture (*Sharma R.P., 1971*).

As for shelter, we have no evidence of any permanent structures but because timber was easily available, the building of hutments can be reasonably inferred. Fuel was also in plenty and hearths supplied them warmth as well as food.

Discussion

It is difficult in the present state of our knowledge to say anything definite about the people responsible for the production of the O.C.P. In the initial state *i.e.* in Central Doab, the O.C.P. types are not only limited but their finish is also somewhat unsophisticated giving an impression that perhaps they were manufactured by a primitive community. However, the incised designs on the sherds connect the tradition of decoration with Bara. In Upper Doab, a rich variety of pottery types, which are Harappan derivatives is significant. It may not be out of place to mention that some influence of the Cemetery-H pottery is discernible in the pottery types at Ambkheri. A miniature dish-on-stand, reported from explorations at Jhinhana, has striking formal similarity with the one found in the excavations at Bara.

The region of the upper reaches of Saraswati and Sutlej valleys was the only out-let for the people living in upper Ganga Yamuna Doab to exchange ideas and cultural traits with the people living in the Indus system of rivers. It is not unlikely that this area was the meeting point of various cultures.

The extension of O.C.P. in Rajasthan was through the tributaries of Yamuna. As most of Harappan shapes are practically absent from the O.C.P. complex of this region, it is likely that this intrusion took place from Central Doab, as is evident from the presence of handled pots and painted and incised pot-sherds. This proposition is strengthened by the evidence of the movement of a later culture in the same belt or presence of black-and-red ware between O.C.P. and P.G.W. deposits at Atranjikhera, Noh and Jodhpura.

A question is sometimes posed : the O.C.P. represents one culture or many phases of one culture or there were several entirely different cultures (*Ghosh, 1971-72*) ? If the O.C.P. of Ambkheri be taken as a case study, it can be seen that although in fabric it compares with the pottery from Atranjikhera, Saipai and Ahichchhatra, it differs from all of them in form and other details. The pottery types from Baharia and Saipai have also no marked similarity. To my mind it appears that there are regional differences within the culture, as one can notice from the difference in the culture-complexes of Central and Upper Doabs.

The chances of the culture evolving locally somewhere in the Central Doab are rated high (*Gupta, 1963*). The use of copper-Hoard types by these people cannot be ruled out. However, it appears that it is only in later stage that the O.C.P. users, while moving towards the Upper Doab, and further west, came in contact with the other chalcolithic culture of this region.

Chronology

The upper reaches of the Ganga valley, where a concentration of the Ochre

Coloured pottery settlements have been noticed, could not provide the exact chronological position of this ware vis-a-vis the Harappan, including Bara. So far the Harappan culture of this region has not been scientifically dated. The O.C.P. chronology is suggested here on the basis of a general reconsideration of archaeological evidence.

It appears that classical Harappan culture did not survive beyond 1700-1600 B.C. But this tradition did not die abruptly. It underwent transformation in Gujarat where late Harappans lived with Lustrous Red Ware users; in the Punjab and Haryana in the form of Late Harappan they overlapped with the P.G.W. (*Joshi, 1977*) and in Upper Doab with O.C.P.

The exploration in Upper Doab revealed two group of sites. There are certain settlements where Harappans were found living with the O.C.P. users, whereas there are also sites which are absolutely free from any Harappan admixture except for some typological similarity in pottery. They do not yield anything Harappan as such. In Central Doab, even this typological echo is absent. Hence the absence of Harappan forms from Central doab and two groups of pottery in Upper Doab suggests a kind of loose chronological sequence which no doubt requires further confirmation. The pure Harappan sites in the Upper Doab and the O.C.P. sites in Central Doab could be bracketed together as far as chronology is concerned. For the list of sites so far discovered see Appendix.

The Harappan phase noticed at Alamgirpur has been dated by me elsewhere between 1600 B.C. and 1300 B.C., while Bargaon has been placed between 1300 B.C. and 1000 B.C. as it has overlapped in this region with some O.C.P. types which are not present at any known pure Harappan site (*Dikshit, 1977*).

Taking into consideration the early beginning of the O.C.P. in Central Doab, a time bracket from 1600 B.C. to 1000 B.C., or a century or two earlier, seems to be quite justified for the present. As some grey ware sherds have been found in the excavations at Ambkheri, and a few types of O.C.P. continued in later P.G.W. culture, it is likely that the in Upper Doab and overlap of the O.C.P. with the P.G.W. may be reported earlier than we can think of. But in Central Doab, this overlap may be with black-and-red ware, or both, differently at different sites. It may be noted that black-and-red ware in pre-P.G.W. levels have been noticed so far at least at only two to three sites.

Recently, thermoluminescent tests on the Ochre Coloured pottery with soil samples from four different sites, Atranjikhera, Lal qila, Nasirpur and Jhinjhana, have provided a very big time-bracket to this culture (*Fig. 10*). The Ochre Coloured pottery samples from Jhinjhana and Nasirpur were collected by the author at the instructions of Shri B.B. Lal, former Director General, Archaeological Survey of India, whereas the samples from Atranjikhera and Lal Qila were collected by Aligarh Muslim University. Prof. S. Nurul Hassan has kindly got these samples dated by Dr. D. W. Zimmerman of the Research Laboratory for Archaeology and History of Art, Oxford University. It is needless to emphasize that the full impact of thermoluminescent method of dating in the interpretation of ancient chronology will take some time.

Emergent Picture

1. The Ganga-Yamuna Doab was not a cultural vaccum before the arrival of

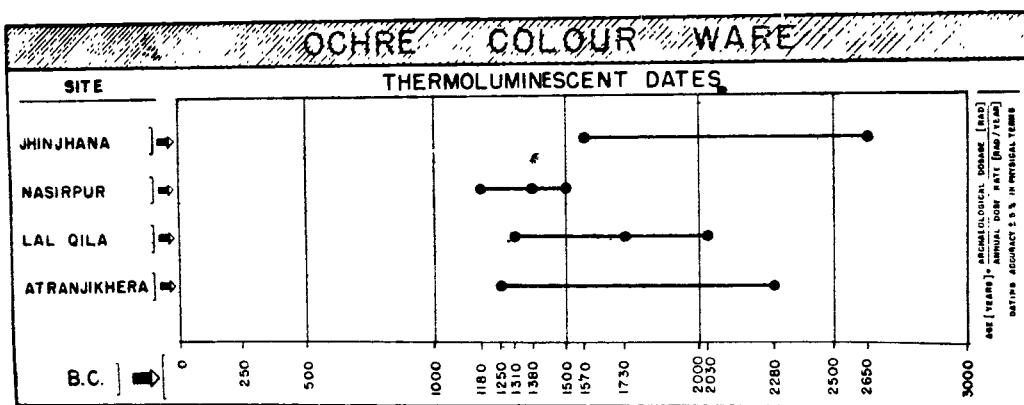


Fig. 10

Harappan communities.

2. The Ochre Coloured pottery users were original inhabitants of the Ganga valley.
3. There was no cultural vacuum in the Doab once it was inhabited by the Late Harappan and O.C.P. peoples in the 2nd millennium B.C.
4. The O.C.P. in its early phase overlapped with the late Harappa. In the late phase it may overlap with the black-and-red ware in the Central doab and with the P.G.W. (?) in the Upper doab.

Appendix

Ochre-Coloured Ware Sites in Uttar Pradesh

Sites	District
Morthal	Aligarh
Bisauli	Badaun
Rajpur Parsu	Bijnor
Bhetpura, Khanpur, Lal Qila, Manpur	Bulandshahr
Atranjikheda	Etah
Saipai	Etawah
Hastinapur, Kaseri, Kasimpur, Kher Khanda	Meerut
Jhinjhana, Sikrera	Muzaffarnagar
Ambkheri-2, Aneki-5, Gadharona, Garh (Qutubpur), Hetampur, Mayapur, Nasirpur, Puranpur,	Saharanpur
Salempur, Mahdud, (Kan Khali), Shikarpur,	(In Ganga Valley)
Teliwala, Thataula (Khempur Kalera)	
Aghiana, Bakarka, Bhoksi, Buddhakhera, Gathera, Handowala, Hardakheri, Jainer, Kajipura, Khatauli, Mandla, Nirpalpura Urf Dhomwala, Pajrana Rajdhana, Salempur, Sarupura Taga, Shukartal, Sikri.	(In Yamuna valley)

Asanwali, Bahdoki, Baundiki, Bazidpur Majra, Chhajapura, Chhaparheri, Chilhera Daudpur, Fatehpur (Gujar), Fatehpur Jat, Ghana Khandi, Hulas, Kabirpura, Kailapur, Khatauli, Krishni, La khnauti Kalan, Matki-Jharauli, Mandla Mahiuddinpur, Nayavans alias Nayagaon, Piki, Pinjaura, Reri, Malakpur, Sarkan Sheikh, Sherpur (Gujar).

Baharia

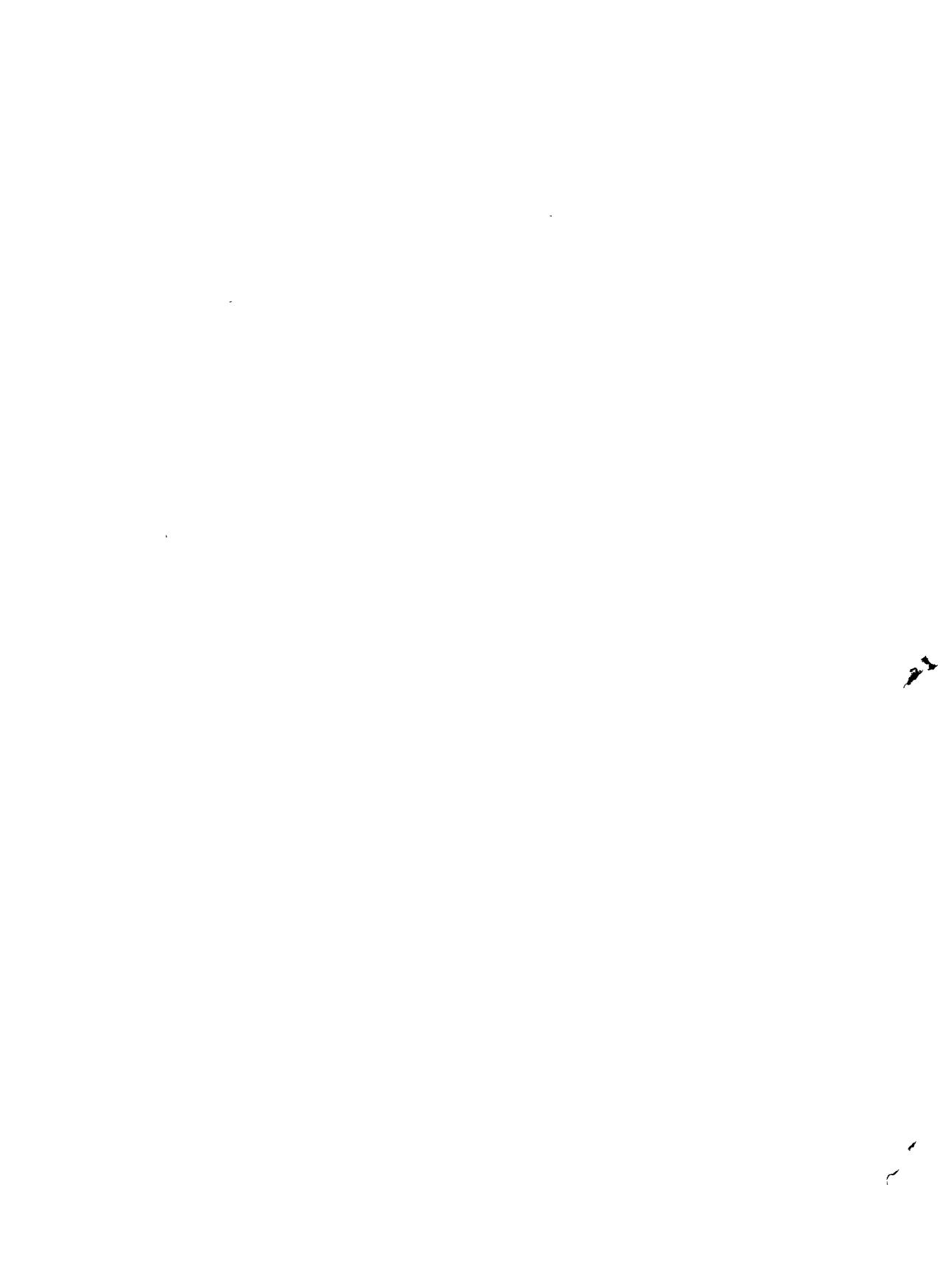
(Sites with Harappan and
O.C.W. in Yamuna valley).

Shahjahanpur

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The Neolithic Cultures of Eastern India

20

LALA ADITYA NARAIN

MORE THAN a century ago, some enthusiasts, particularly geologists, enlightened christian missionaries and civil servants, started the collection of neolithic tools in eastern India. Some of them even published descriptive notes on them in learned journals. These surface collections ultimately found their way to different museums in India and abroad.

The first neolithic implement was discovered in Singhbhum by Captain Beaching (*Beaching, 1868, p.177.*). Two years later, V. Ball, a geologist also discovered neolithic tools from the same area (*Ball, 1870, p. 268*). P.O. Bodding, a Norwegian clergyman, collected sizeable number of neolithic artifacts from the Santhal-Pargana district in the year 1901 and 1904 (*Bodding, 1901, pp.17-22; 1904, pp 27-31*). S.C. Roy, an anthropologist, made a large collection of neolithic tools from different areas of Ranchi district (*Roy, 1916, pp.61-77*). In 1926, U.N. Brahmachari found two neolithic implements in a tank at Jamalpur (*Brahmachari, 1926, p.136*). J.H. Hutton discovered a shouldered celt at Rajgir in Patna district (*Hutton, 1131,p.360*). Anderson surveyed the Sanjai river and discovered ground tools buried under an alluvial deposit, about 18 ft. thick, near Chakradharpur (*Anderson, 1917. pp.349-62*). In 1950, Sen revisited Singhbhum area and located a celt site near Barda bridge 4½ south-east of Chakradharpur (*Sen, 1950, pp.1-12*). At Bongara in Manbhum (Dhanbad), a neolithic site was discovered on a hill terrace (*Ray, 1954, pp 16-10*). These find spots indicate that the neolithic inhabitants selected high plateaus and terraces, above the flood level of the rivers, for their dwellings, particularly in southern hilly region of the State of Bihar,

The artifacts included rounded-butts axes, chisels, wedges, thick-butts axes, perforated stones, hammerstones, faceted tools, shouldered axes, splayed-edge axes and the bar chisels. The tenons of the shouldered axes were obtained either by sawing or by wire-cutting (*Ball, 1879, p.397, Allchin, 1962 p.321*). The rocks employed for their manufacture were slate, quartzite, basalt, sandstone, gneiss, phyllite, epidiorite and limestone. Chipping, pecking, grinding and polishing techniques were adopted. The choice of the rock depended upon the local availability.

In Bengal, there are two main zones, the western and the northern. The Western Zone consisting of districts Bankura, Birbhum, Midnapur and Purulia, have yielded a

fairly good number of neolithic artifacts. Geologically these districts are part of the Chhota Nagpur plateau. The Northern Zone particularly comprising of Kalimpong sub-division of the Darjeeling district, is also rich in neolithic tools (*Walsh, 1904, pp.20-24*). Other surface collections from this area have been described by Coggin Brown (*Brown, 1917, p.130*). Sen described a celt site at Bamal in the Jhargram Sub-division of Midnapur district (*Sen, 1948, pp.252-53*). The tools discovered in Bengal were triangular axes, ringstones, rounded butt axes, axes with rectangular section and shoulderd celts. These discoveries indicate that in Bengal also the neolithic inhabitant preferred hilly surroundings.

For want of field investigation we have little information about the discoveries of the neolithic tools in Orissa. R.P. Chanda reported neolithic tools from Bairipur in Mayurbhanj district (*Chanda, 1923-24, pp.100-1*). Rounded-butt axes, wedges, hammerstones, faceted and shoulderered celts and bar-chisels also have been reported from this area. At Kuchai, a small scale excavation was undertaken which brought to light polished stone implements along with coarse grit tempered brownish-red potteries, occasionally slipped and incised. The implements comprised rounded butt axes, faceted hoes, chisels, pounders, fragmentary mace-head and a grinding stone.

Assam as a geographical unit is very much different from Bihar, Bengal and Orissa since it occupies the lower Himalayas. The first discovery of jadeite neolithic tool was reported from upper Assam by Sir John Lubbock (*Lubbock, 1867*). In 1870, E.H. Steel discovered more jade tools from the villages of Namasang Nagas (*Steel, 1870, pp.267-68*). Lt. Barron reported the discovery of two neolithic tools from the Naga Hills (*Barron, 1872, pp.61-62*). A British tea planter, W. Penny discovered a substantial number of neolithic tools while digging a ditch near Tejpur. The entire discovery was catalogued by Coggin Brown (*Brown, 1917, pp.131-33*). Later on two separate papers were published by Coggin Brown and H.C. Dasgupta (*Dasgupta, 1913, pp.291-93*). A large collection was made by J.H. Hutton, J.P. Mills, G.D. Walker, J.H. Grace, and C.R. Pansey from different parts of Assam. A collection of 385 neolithic tools from Assam is housed in the Pitt Rivers Museum, Oxford. Hutton classified the collection from the Naga Hills into triangular, rectangular and shoulderered celts. He traced the affinity of the tools of the first two categories with the tools from Peninsular India and of the shoulderered variety with the shoulderered celts from Burma and beyond (*Hutton, 1928, pp.228-32*). Barua published a paper on Assam Neolithic Culture in which he summarised the discoveries made up to his time (*Barua, 1939, pp.6-18*). Pratap Chaudhuri also wrote a paper on the neolithic tools but he more or less confined himself to anthropological problems (*Chaudhuri, 1944, pp.41-47*).

In 1960, Dani dealt with the neolithic problem of Eastern India with particular emphasis on Assam neolithic tools (*Dani, 1960, pp.41-77; and pp.85-104*). He based his study on the available surface collections up to his time. The close relationship between the raw material and the tool forms made Dani divide Assam into six geographical zones. The zonal study of the tool types facilitated in locating the intrusive element (typological) in each area. He classified Assam tools into faceted tools, shouldered celts, splayed-edge axes, round-butt axes, wedges and grooved hammerstones.

Like Dani, Krishnaswami also reassessed the neolithic problem of India. He divided the neolithic tools found in the different parts of the country into four provinces, namely, A,B,C and D. While doing so he did not maintain the distinction between the

neolithic and the chalcolithic cultures and included the chalcolithic cultures of Deccan and Western India within the fold of the 'neolithic' because economically they were at the same stage. The tools of the eastern India were put in province 'C'.

As regards the neolithic tools of eastern India, he has observed that faceted tools, shouldered hoes and splayed axes were found in abundance in south-east Asia and they came to India at a later date. This is proved by their sporadic occurrence in eastern India. Further, he has argued that in eastern India as well as in south-east Asia two different traditions continued side by side. The tools of the first tradition displayed flaking and chipping techniques, their edge portion was polished whereas the tools of the second tradition were ground, sawn and fully smoothened. The main centre of this tradition can be located in Malya and Indo-China ((Krishnaswami, 1960 pp. 25-64).

According to T.C. Sharma (1966), Dani's classification was based on certa-in pre-conceived notions. He did not take into account the technological aspect of the tools. Sharma broadly divided the neolithic implements mainly on technological grounds, into edged, ground, pecked and ground, fully ground and miscellaneous categories. These were further sub-divided into sub-groups according to the shapes of the tools, their cross-section, size and function. However, for a better understanding of these tools, regional grouping is generally considered more appropriate.

✓ *Cachar Hills* : Small flat celts, tanged celts, quadrangular celts, adzes, splayed-edge axes and chisels were collected for a hundred years by way of surface explorations. Recent field work in this area by M.C. Goswami and T.C. Sharma has added four more types of neolithic artifacts such as grinding stones, querns, mullers and smoothening stones for weapons.

Garo Hills : The neolithic implements were collected from the north-western face of Arbela range at a height between 750 and 600 m. from Rongram, Rangchangiri, Chitra Abri, Ronchungta, Rombhagiri, Tura and Phalbari. Nearly 1000 tools from this area are presently housed in the Gauhati University Museum. The material is dyke basalt. Technologically, they fall into two categories—only chipped and fully ground. Flat celts are fully ground on the under-surface and their cutting edge is unifacially sharpened. Tanged celts have also been collected in an appreciable number.

Naga Hills : To the east of north Cachar Hills are located the Naga hills which run along the Burmese border in N-E. direction. The first jadeite neolithic artifact was reported from this area in 1867. Later on, Hutton, J.P. Mills, C. Von Furer Haimendorf and others made sizeable collections.

Sharma has classified the tools from this region into sixteen types. According to his classification they fall under three broad groups—edge ground tool, pecked and ground tool, pecked and fully ground implements. The types consist of large axe, tanged axe, round butt axe, wedge shaped axe, quadrangular axe, rounded chisel and rounded adze.

River pebbles of fine grained rock, olive green in colour, were chiefly utilized. Flaking was difficult in this material and as such shape was achieved by pecking. Generally the edge, was ground in a semi-circular outline. Since jadeite was not a local material, it is likely that they were imported from Burma or China where there is a huge deposit of this material.

Brahmaputra Valley : Kamrup district is the largest plain area in the western part of the Brahmaputra valley. The sites which yielded neolithic implements include Rami, Loharghat, Tetelia, Kamakhya, Numati and Sonapur. Mudstone and shell were the chief

rocks utilized in the manufacture of the tools but occasionally phyllite was also utilized.

Goalpara is the western most plain district in the Brahmaputra valley. The tools from this area comprised tanged celts, flat celts, adzes, rectangular and broad axes. Amongst these the rectangular axe is of unusual type. The shape of this tool compares well with the 'Pan Shan Axe' of north-west China.

Darang district is a long alluvial plain which extends from the northern bank of the Brahmaputra valley to the foot-hills of the Himalayas. Majority of the tools of this area were on slate, one of gneiss and some of porphyrite and volcanic ash. The types were axes, grooved hammer-stones, simple hammer-stones, celts, grinding stones, small and flat ovoid pebbles.

Lakhimpur is the eastern-most district in the Valley of Brahmaputra which serves as doorway into Assam from Burma and eastern Asia. Saikia collected 21 tools from Lahowal, Naharkotiya, Barkhamti and Gaon. Shale and sandstone were chiefly utilised but tools made of jadeite and igneous rocks were also met with. The types were tanged celts, flat celts, quadrangular axes, chisels and miniature celts of jadeite. They showed close affinity with the Naga and the Garo Hill specimens.

Khasi Hills : This is the eastern part of the Assam plateau. Shouldered celts akin to south-east Asian and Chota Nagpur examples were collected from this region. In addition to these, triangular and quadrangular celts with flat sides were also discovered.

Manipur : It lies south-west of the Naga Hills on the Burmese border. This area has so far yielded one celt of trapezoidal shape.

Mizo Hills : This is the southern-most hill district of Assam. A large sized axe with broad and thin blade and rectangular section has been discovered from Aijal. There are three perforations near the butt end, two of them are complete, which were probably used for hafting.

NEFA : The Mishmi and the Abor Hills on the bank of the Dihong river in the NEFA area have yielded eighteen tools, out of which six are of jadeite and the rest are on local rocks, like sandstone, basalt, gneiss, schist and talcose.

Typological study of the neolithic tools of eastern India suggests that the faceted tool, shouldered celt, bar-chisel and splayed-edge axe were not indigenous types, rather they were intrusive elements. Their occurrence in eastern India led Worman to suggest that China was the source of Indian neolithic celts (*Worman, 1949, pp. 181-200*).

While summing up his observations on eastern Indian neoliths, Dani also observed that some of the types were imported but that does not mean that China was the source of Indian neolithic celts. He has argued that the rounded-butt axe is the most common tool in the neolithic culture of India. This type is available in Assam but in small numbers. However, in northern China this variety is found in abundance but along with adze. If China is taken to be the source of Indian neolithic celts, adze blades should have been found in appreciable number but the number of true adzes is limited in India.

Faceted tools have been reported from Ranchi and Santhal pargana in Bihar, Mayurbhanj in Orissa and Darjeeling in W. Bengal. There are two varieties-rectangular and triangular. Boths these varieties are available in Orissa but not in Assam. The rectangular variety is found in southern Bihar and Bengal and is made of local stones. The discovery of three faceted jadeite tools from Lohardagga in Ranchi, however, suggests that they were imported from Yunnan. The specimens on local materials were imitations.

The shouldered celts have been collected from Santhal Pargana, Singhbhum, Manbhumi (Dhanbad) and Rajgir in Bihar, Mayurbhanj in Orissa, Garo, Khasi and Naga Hills in Assam. Garo and Khasi hills have yielded the irregular variety whereas both the regular and the irregular varieties are known from Naga and Cachar Hills. The regular variety of the shouldered celt is commonly found in Burma. It, is therefore, possible that this type entered into eastern India through Assam.

The bar-chisels discovered in Bihar and Orissa in small number have resemblance with the Malayan specimens.

The splayed-edge axes found in Assam and Orissa are similar to those known from Burma, Yunnan and Malaya.

The excavations at Daojali Hading in north Cachar Hills by Goswami and Sharma have given considerable insight into the neolithic culture of Assam (*Sharma, 1966*). The excavation revealed that the neolithic inhabitants of this area settled on a compact yellow land surface. They probably lived in mud walled houses. Apart from stone implements, three varieties of pottery were also exhumed. The highest representation was of chord impressed grey pottery, the dull and the brick-red pottery were poorly represented. The grey variety was made of coarse clay mixed with quartz particles. The fabric was thick. On the other hand, the red pottery were of thin fabric and well baked. Shapes of the pots could not be obtained as the sherds were found in small bits.

The stone artifacts comprised small celts, adzes, chisels, shouldered celts, grinding stones, querns and mealing troughs, mullers, and quartzite pebbles. Sandstone and shale were chiefly utilized to manufacture the artifacts.

Sharma (1966) has pointed out that the shouldered axes were not obtained by wire cutting. Rocks like shale and sandstone can be cut by slivers of bamboo or sharp edged shell. Harder rocks like flint or quartzite can be first blocked out by flaking just in the way the Aterians did earlier, Gupta also had made more or less similar observation on this point. (*Mishra and Mate, 1965, pp,92-100*).

The discovery of querns and mealing troughs, muller and shouldered axes suggests that some kind of cultivation was practised.

On the basis of these discoveries, Sankalia observed that Assam neolithic drew its inspiration from south-west China and Indo-China. The cultural assemblage of Daojali Hading was comparable with the late Bacsonian of S.E. Asia. The major role was played by the upper Yangtze valley of Szechwan and Yunnan in developing the neolithic cultures of Assam. In the absence of reliable evidence, it is difficult to prove the impact of the peninsular neolithic culture on Assam. Future investigations however, may prove that Assam was the meeting point of east Asiatic and peninsular neolithic cultures of India (*Sankalia, 1974, pp.283-298*).

Four stages of cultural development have been obtained at Daojali Hading. They are Hoabinhian, early neolithic, late neolithic and neolithic. The first two have not been dated but the late neolithic phase has been assigned to about 200 B.C.

The views expressed by the different scholars are mostly based on surface collections. Hence, it is not possible to give any confirmed opinion on the neolithic problem of eastern India. Shashi Asthana (1976) in her recent work has, therefore, rightly observed, "In the present state of our knowledge, we can only say that south China and south-east Asia both appear to have played important part in sending the proto-types of tools, like

splayed axes, rectangular or faceted axes, shouldered celts, wedge blades and grooved hammers into the eastern region of India."

Recently a neolithic site has been discovered in the vast alluvial tract of north Bihar at Chirand in the district of Saran. Prior to this discovery it was held that the neolithic communities of Bihar inhabited the hilly surroundings of south Bihar. This discovery has made a major break-through in our knowledge of the neolithic cultures of eastern India.

The excavations yielded evidence of carbonised *munga*, wheat and rice which suggests that the neolithic community of Chirand had the idea of raising the summer and winter crops separately. Besides these, heaps of refuge bones of fish, snail, molluscs, bird, tortoise, cattle and deer and carbonised seeds of berries were also unearthed. In a way these discoveries demonstrably speak that the society had solved the subsistence problem by raising cereals, hunting games and collecting fruits and nuts.

A variety of tools and weapons made of stone, bone and clay were in use to meet the various needs of daily life.

The microlithic tools, such as parallel sided blades, points and arrow-heads, were manufactured locally out of siliceous materials, like chalcedony, agate and chert. It is evident from the large number of waste flakes, cores and discovered from the excavated areas. Most likely, the raw material in the form of nodules was collected from the dried bed of the river Son flowing not very far from Chirand. Such materials are still found in that river.

The ground tools were poorly represented. Only two rounded butt axes were discovered. Other artifacts of stone were balls, fragments of querns and flat rectangular pounders made of granite.

A variety of tools and weapons were made of antler, long bones and tortoise shell : bar-cebt, bodkin, knife, awl, leather cutting tool, weeding tool, spear-points, drill, shaft-straightner, socketed comb, pendant, chisel, wedge, arrow-head and divider. The heavy duty tools were made on antler and the sophisticated tools were on the long bones. Nearly four hundred such artifacts were collected in a fair state of preservattion.

Burnt clay balls ranging in diameter from 1" to 2½" were collected in sizeable quantity which might have been used as missiles.

A variety of vessels were shaped with the help of mould and wheel. The clay used was sandy as is evident from the sections of the pot-sherds. The wares encountered included red ware, pale to deep grey ware, black ware and black-and-red ware. The types consisted of vases of different shapes, simple bowls, oval bowls, perforated bowls, miniature pots, bowls, with short stand and bowls with ring base. Vases meant for storing liquid had long spouts luted to the shoulder. Some of the vases had elongated base, the lower portion which must have been kept buried in the ground to keep them erect. Probably they served the purpose of storing grains. Cooking vessels had rusticated base but their shoulder and neck portions were treated with a thick slip.

Miniature pots in deep grey and black wares were decorated with post-firing paintings in ochre colour. The designs consisted of criss-cross, concentric semi-circles, horizontal rim bands and trident like object. Other modes of decorating the vessels were applique designs and graffiti marks.

As the pots were made of sandy clay, their surface was porous which easily absorbed the moisture and helped in quick disintegration. Therefore, the pots were

burnished to make the surface impervious.

The discovery of numerous beads made of carnelian, chalcedony, agate, steatite, faience and clay, pendant of bone, amulet of clay bearing incised designs and bangles of bone and clay is a testimony to the prosperous economic condition of the community. They had utilized free hours in artistic pursuits which is evidenced by the discovery of clay figurines of bull, bird and coiled snake.

Most interesting were the ovens. Sometimes they overlapped one another indicating different sub-phases of their construction. The oven had the longitudinal passage through which fire-wood was fed as was evident from the orientation of a charred log in one of the ovens. Attached to it there were sinuous side channels through which ash and charcoal were taken out in order to provide space for another piece of wood which could be pushed inside the channel to keep up the flame.

The community had settled down on the brownish alluvial flood-plain of the river Ghagra. Circular plans of the structures, about 2 metres in diameter, their rammed floors and the burnt chunks of mud plaster bearing reed impressions were collected which suggest that they lived in thatched constructions. Since the habitational area was located near the river, it was always susceptible to flood. Another frequent calamity might have been the outbreak of fire when the wind blew violently, especially in the month of May and June. In spite of these calamities, the neolithic society at Chirand continued there for pretty long time which is attested by the thick cultural-deposit of nearly 2 metres. A series of black and yellow bands in the habitational area bear testimony to the fire havoc. When the dwellings got demolished by fire, they paved the ground by spreading yellow sticky earth brought from the river side and raised new constructions over it. (*Narain, 1970, pp.16-35*).

Samples for determining the date of the neolithic horizon have been sent to the Physical Research Laboratory Ahmedabad. One of the samples from the topmost horizon of this phase has given us a date around 1650 B.C. Hence a date near about 2400 B.C. is expected.

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Abbreviations

1. *J.B.O.R.S* Journal of the Bihar and Orrissa Research Society, Patna.
2. *J.B.R.S.* Journal of the Bihar Research Society, Patna.
3. *P.R.I.A.* Proceedings of the Royal Irish Academy, Dublin.
4. *P.A.S.B.* Proceedings of the Asiatic Society of Bengal, Calcutta.
5. *J.A.S.B.* Journal of the Asiatic Society of Bengal, Calcutta.
6. *J.R.A.I.* Journal of the Royal Anthropological Institute, London.
7. *J.A.R.S.* Journal of the Assam Research Society, Gauhati.
8. *A.S.I.* Archaeological Survey of India.
9. *W.A.S.*
10. *I.A.R.* Indian Archaeology-a review.



FOUR

IRON

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1

Early Iron Age in Gangetic Doab

21

PURUSHOTTAM SINGH

THE INTRODUCTION of iron as the principal metal for tools and weapons heralded a new age in the Gangetic Doab. It gave fresh impetus to, and accelerated the pace of development in practically every walk of life, leading ultimately to the rise of the cities in this area. The advantages of this metal were manifold : the iron ores were far more readily available than copper ores and because of its ubiquity, iron seldom needed to be deep mined in antiquity. The most early mining for the ore was of the open cast type or *grubbing*. Again, this new metal had definite advantages over copper and bronze in as much as it was cheaper to produce than bronze and it had more tensile properties. Besides, the cutting tools like chisels and saws are better made of iron, to which an edge is more easily put than bronze.

Geographical background

The Indo-Gangetic Doab is divisible into two clearly defined regions ; the Upper Ganga Plain and the Middle Ganga Plain.

THE UPPER GANGA PLAIN

This plain lies approximately between the Yamuna in the west and the 100 m. contour in the east. This sub-humid region measures 550 km. east-west and 380 km north-south comprising the administrative divisions of Meerut, Agra, Rohilkhand, Lucknow and parts of Allahabad and Faizabad. This plain forms part of the alluvium-filled asymmetrical trough. This alluvium is one continuous series of fluviatile and sub-aerial deposits, mainly composed of unconsolidated beds of clay, sand gravel and their mixture in varying proportions (*Singh et. al. 1971*). It is part of the well integrated drainage system of the Ganga and the soils mainly comprise the *khadar* and the *bhangar*.

There are numerous literary evidences to support the fact that the Upper Ganga Plain was covered with thick forests in the prehistoric times. The *Satapatha Brahmana* mentions the advance of Agni eastwards upto Sadanira (modern Gandak enabling the Aryanisation of Videha (*Agrawal 1967-68*). The area was covered by thick forests of *sal*

which have now all but disappeared (*Agrawal, 1975*). Iron was needed for clearance of these forests. This was done during the last three millennia of human occupation in the region when gradual clearing of the natural vegetation for cultivation continued.

THE MIDDLE GANGA PLAIN

The Middle Ganga Plain is again a seemingly featureless plain and is a continuation of the Upper Ganga Plain. It covers the regions of eastern U.P. and Bihar. Lying on either side of the Ganga and the Ghaghara, it comprises the administrative divisions of Varanasi, Gorakhpur, Bhagalpur and Patna. It measures 600 km west and 320 km north-south and is a segment of the great Indo-Ganga trough. The alluvial filling is supposed to be comparatively less in thickness than in the Upper Ganga plain. The Ganga-Ghaghara Doab has a number of ox-bow lakes and deserted channels of river and most of the land is *bhangar*.

There are well-documented evidences that the area was under great political activity during the sixth century B.C. and with the rise of Magadha as the imperial power during the *Haryanka* dynasty this land dominated practically the whole of northern India in a very limited time-span.

Archaeological Evidence

Archaeological investigations carried out during the last three decades have yielded valuable data about the earliest iron-using communities of the Indo-Gangetic Doab. Some of the principal sites which are pertinent in the present discussion are as follows :

1. *Hastinapura* : The ancient site representing the capital of the Mahabharata heroes is situated on a deserted bank of the Ganga in the Mawana Tahsil of Meerut district. The site was vertically excavated in 1950-52 by the Archaeological Survey of India under the direction of B.B. Lal (*Lal, 1955*).
2. *Ahichchhatra* : The capital of the north Panchala is identified with the ancient site situated near the village of Ramnagar in Bareilly district. It was superficially excavated by Cunningham but more extensive excavations were carried out by the Archaeological Survey of India under the direction of K.N. Dikshit and A. Ghosh during 1940-44. The site was further tested by N.R. Banerjee of the same institution during 1963-65.
3. *Atranjikheda* : The ancient settlement of Atranjikheda is located on the right bank of the Kalinadi, a tributary of the Ganga in the Etah and Tahsil of Etah. It was excavated for several field-seasons since 1963 by the Aligarh Muslim University under the direction of R.C. Gaur.
4. *Alamgirpur* : This site is situated on the left bank of the Hindon, a tributary of the Yamuna in the Meerut district. It was excavated by the Archaeological Survey of India under the direction of Y.D. Sharma.
5. *Allahapur* : This site again, is located 13 km west of Muradnagar on the left bank of the Hindon, in district Meerut and it was tested for one field-season by Romila Thapar and K.N. Dikshit.
6. *Khalaua* : The small and compact mound of Khalaua measuring 242 m east-

- west and 148 m north-south, is located 16 km. from Agra on the Agra-Jagner road. The site was tested by Y.D. Sharma in 1965-66.
7. *Kausambi* : The ruins of Kausambi were located near the modern village of Kosam, 52 km south-west of Allahabad on the northern bank of the Yamuna. A small-scale excavation was conducted by the Archaeological Survey of India in 1937-38 and since 1948 it has been extensively excavated by the University of Allahabad under the direction of G.R. Sharma, (*Sharma, 1960 ; 1969*).
 8. *Rajghat* : The remains of the ancient city of Varanasi were accidentally discovered in 1940 on the north-eastern outskirt of the present city and it was excavated by the Banaras Hindu University under the direction of A.K. Narain (*Narain and Roy, 1976 ; 1977 ; Narain and Singh, 1977*).
 9. *Prahladpur* : This site is situated on the right bank of the Ganga in district Varanasi and a limited excavation was conducted by A.K. Narain & T N. Roy of the Banaras Hindu University (*Narain & Roy, 1968*).
 10. *Chirand* : This ancient settlement is located on the left bank of the Ghaghara near Goldinganj railway station (N.E. Rly) about 11 km east of chapra town in Bihar.
 11. *Noh* : Outside the Indo-Gangetic doab proper but crucial to the present discussion is the site of Noh in district Bharatput. The ancient mound is located about 7 km west of Bharatpur on the Agra road. It has been intermittently excavated by the Rajasthan State Department of Archaeology under the direction of R.C. Agrawala.

Culture-Sequence

The sequence of early cultures of the Indo-Gangetic doab known in a limited way by the excavations at Ahichchhatra was stratigraphically firmly established by the diggings at Hastinapura. The sequence of cultures obtained from Hastinapura was as follows :

- Period I-Ochre Colour Pottery
- Period II-Painted Grey Ware Culture
- Period III-N B P Ware Culture
- Period IV-Sunga-Kushana Culture.

Of these, the first three periods are important in the present context.

This sequence of cultures underwent a slight modification by new evidences from Atranjikheda where a definite and independent horizon of Black-and-Red ware culture has been noticed. Thus, there is a new sub-period between Periods I and II of Hastinapura sequence. This finding has been further corroborated by evidence from Noh, but limited digging at Khalaua and Allahapur does not show an independent horizon for the Black-and-Red ware culture. Instead, the two potteries are found from the very beginning of the habitation at Khalaua and both the potteries seem to form part of a single culture. At Allahapur the earliest period has been divided into two sub-periods. Although PGW and B-&-R Ware occur side by side. Black-and-Red ware predominates in the lower levels of sub-period IA while in the succeeding sub-period, PGW takes the pride of place.

Painted Grey Ware culture at Allahapur has been assigned a comparatively long time-span and it has been claimed that the PGW continued to be used right upto the Mauryan period.

At Kausambi, the Painted Grey Ware occurs in Period II (*Sharma, 1969*) where Black-and-Red Ware predominates along with the Red Ware.¹ Sharma remarks that the PGW at Kausambi represents a late and decadent stage of PGW of the Upper Ganga Valley, Punjab and Rajasthan (*Sharma, 1960*) and dates this period to c. 885 to 605 B.C.

The Stratigraphical position of Iron in the Gangatic Doab

The inhabitants of the PGW culture at Hastinapura (Period II) used only copper as their chief metal (*Lal, 1955, p.13*) and no iron *objects* were found although lumps of iron-ore and slags were met with in the upper-most levels of this period. Iron tools were reported from the *earliest* levels of the PGW deposits for the first time only at Alamgirpur. Here, iron tools occurred throughout the 4½ ft. thick deposit of Period II. Subsequently, the same position was confirmed in the excavations at Atranjikhera where iron tools are totally absent in the black-and-red ware deposit (Period II), but these are present in sizable number *throughout* the occupation of the subsequent PGW period (Period III). A similar situation obtains at Noh also where iron objects are present in the PGW deposits (Period III). However, a new dimension has been added to the stratigraphic position of iron objects by the discovery of iron from the Black-and-Red ware deposits (Period II) at Noh in the excavation of 1971-72. Here, shapeless iron-pieces have been recorded from the Black-and-Red ware deposits.² Iron tools have also been reported from sub-period IA at Allahapur where Black-and-Red ware is the principal ceramic industry but is associated with the PGW ware. Thus it seems reasonably certain that the Black-and-Red ware people did have a limited knowledge of this metal.

Iron tools have also been reported from the PGW ware deposits at Ahichchhatra. However, it is not clear from the interim reports whether these objects occur in the earliest deposits of PGW Ware period³. Iron tools are conspicuous by their absence from the limited dig at Khalaua.

Tool Typology

Although no definite tools were found in the PGW levels at Hastinapura, much emphasis has been placed on the occurrence of iron-slags in the upper levels of this deposit at this site simply because it provides the earliest evidence of smelting of iron in the Gangetic plain. Since, Hastinapura is devoid of any finished tool of iron, one has to fall back on the sole evidence of iron tool types from Atranjikhera

1. There is a subsequent change in the numbering of these periods at Kausambi. Here, Period I has been further sub-divided into two. Therefore, Periods II, III and IV have been subsequently re-numbered as III, IV and V respectively. (*Sarma, 1969, XIV*).
2. This position, if proved in the subsequent excavation at Noh and other sites in the region in future digs, will force us to modify the current assumption that the authors of the PGW were the first to introduce this metal in the Indo-Gangetic Doab.
3. Period II according to the revised sequence of 1964-65 excavation.

and Noh only for the PGW culture. Thus while arrowhead, spear-head, knife, hook and chisel have been recorded from the former site, the inventory at Noh includes spear-head, and arrowhead with leaf-shaped pointed and socketed tang, an axe with a broad cutting edge and dishes¹. At Alamgirpur, the iron tools comprised a spear-head, a barbed arrowhead and nails or pins. At Kausambi, small fragments and shapeless bits of iron were discovered as early as SP. I 3. This structural period has been assigned to Period I (of earlier terminology) and dated c. 1025 B.C. to 955 B.C. However, objects of distinctive shape occurred in SP. II. 5 (date-range 885 B.C. to 815 B.C.) and continued to be in use throughout the PGW deposit at the site (*Sharma, 1960, p. 45*).

Material Culture of the PGW People

The inhabitants were essentially an agricultural community with cattle-breeding as their principal occupation. These people depended on agriculture and domesticated cow, buffalo, pig, goat, sheep and horse. They lived in houses of mud-bricks and their house-walls were occasionally made of reeds plastered with mud. They ate rice (and perhaps lentil) and supplemented their food with beef, pork, mutton and venison and even horse's flesh. This is attested to by the fact that charred bones of humped cattle, buffalo, sheep and pigs bearing definite cut-marks on them have been recorded from Hastinapura. Food was also supplemented by hunting of deer with bows and arrows. Cooking was done on simple one-mouthed *chulah* with horse-shoe like sides. The people wore necklaces, pendants, ear-ornaments and bangles made of semi-precious stones, terracotta and glass. Spinning was done on one or two-holed terracotta discs and for wearing, double pointed bone pieces were used. They used arrow-heads, antimony rods, nail parers and bones of copper and arrow and spear heads of iron. For day-to-day use, earthenware pots were the principal utensils.

Chronology

The Chronology of the PGW culture, which seems to be the first definite user of iron tools in the Gangetic Doab, has been a matter of controversy among scholars. After the excavation at Hastinapura, in the absence of any other dating material and depending solely on the stratigraphic evidence, Lal assigned a date-range of 1100-800 B.C. for this culture. On the contrary, Wheeler (1959) thought that a time-bracket of 800-500 B.C. should be more appropriate for this culture. The availability of a number of radio-carbon dates has added more problems regarding the chronology, rather than solved any. So far, five dates from Hastinapura, four dates from Noh and two dates from Atranjikhera have been obtained. Besides, there are three dates from Khalaua and one date from Allahapur—all coming from the PGW horizons. The dates from Hastinapura fall between 570 and 335 B.C. while those of Noh range between 820 B.C. and 940 B.C.² One sample from Atranjikhera gives 535 B.C. while the other is dated to 1025 B.C. This last date of Atranjikhera is the only radio-carbon date which goes to support the early dating of this culture. Otherwise, all the fourteen dates seem to support the

1. A comparative study of these tool-types is not possible as most of these remain unpublished.
 2. Based on half-life of 5730 years.

younger time-braket of 800-400 B.C. proposed by Wheeler. Admitted by, one cannot put too much reliance on these handful of dates and many samples (a series of samples from each site) are to be run through before one can be anywhere near the solid footing. At the same time it cannot be denied that on the present showing, the radio-carbon dates certainly point out towards the younger time-bracket and this has led Agrawal (1974) and Vibha Tripathi (1976) to propose a time bracket of 800-400 B.C. with the possibility of an extension by about 100 years on either side. Similar views have also been expressed by Sankalia (1974) who remarks that 'the single date from Atranjikheda should be disregarded.' He placed the beginning to this culture to c. 800 B.C.

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Chronology of Iron Age in South India

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Archaeological Data

FOR THE study of the iron age in South India, archaeological data are available from two distinct types of sites—the habitations and the cemeteries. Innumerable sites have come to light right from the beginning of the 19th century. Some of the recently excavated sites are :

- (i) Habitation sites : Brahmagiri, Maski, Piklihal, Sanganakallu, Halingli, Hallur, and T. Narasipur in Karnataka ; Nagarjunakonda, Kesarpalle and Yellesvaram in Andhra Pradesh ; Paiyampalli, Kunnattur, Tirukkampuliyur and Uraiur in Tamilnadu.
- (ii) Grave Sites : Brahmagiri, Maski, Hunur and Jadigenahalli in Karnataka ; Nagarjunakonda, Yellesvaram and Pochampad in Andhra Pradesh ; Amritamangalam, Sanu, and Kunnattur in Tamilnadu ; and Porkalam in Kerala.

Many grave sites dug up by amateur archaeologists in the 19th and the early part of the 20th century also provide some information.

The habitation sites reveal a consistent stratigraphical position and distinctive components of the early iron using culture. This stage is invariably associated with the use of black-and-red ware, and this may be as one of the essential traits of the early iron age, as far as South India is concerned. Stratigraphically the two traits of the iron age culture, viz., iron and black-and-red ware, start in the layers representing the last phase of the previous neolithic-chalcolithic culture, begin to predominate gradually, and thence overlap with the culture traits of the early historic period. This position can be best seen in the well documented sites at Brahmagiri, Maski, Piklihal, Hallur, etc.,

In the town site at Brahmagiri (*Wheeler 1948, pp.204-206*) the iron age culture is represented by a 3-4 feet thick deposit sandwiched between those of the neolithic-chalcolithic and early historic Andhra culture. In one of the trenches, out of the five layers of this deposit (4-8) the lower two (8-7) have the iron age components appearing along with the late neolithic-chalcolithic ones, and in the upper layers (6-4) the com-

ponents of the early historic period also occur. There is not even a single layer consisting purely of the iron age components, but these components increase in number from the lower to the middle level and begin to decrease in the upper phase. This situation is seen in many other sites like Maski (*Thapar, 1957*) Sanganakallu (*Subba Rao, 1948*), and Hallur (*Nagaraja Rao, 1971*).

While most of the above sites situated in the north-western part of South India (mostly in north Karnataka) have the iron age traits overlapping either with the previous neolithic-chalcolithic and the later early-historic culture levels, the sites in the north east and southern parts of the region have levels displaying the iron age traits independently too. At Kesarpalle (*Sarkar, 1973, pp.73-74*) in the lower levels the neolithic-chalcolithic elements are seen mixed with iron and black-and-red ware. Over this is a 5' deposit consisting of the latter elements only. Above this comes a layer in which these elements are mixed with the early-historic northern black-polished ware, and this is further succeeded by levels yielding the russet coated kaolin painted ware. A similar overlap of the neolithic-chalcolithic and the iron age elements, which is succeeded by a deposit consisting of pure iron age elements and followed by a layer mixed with these and some early-historic elements is seen at T. Narasipur (*Seshadri, 1971*,) also. At Kunnattur and Tirukkampuliyur there are iron age levels unmixed with any of the other elements.

The data from the above sites reveal the following material components as distinctive of the iron age. Iron implements like arrow-head, nail or pin, dagger, sword and rod have been found in many of the above sites. Black-and-red ware vessels occur profusely. These are invariably black inside and red outside, and often the black colour is seen extending over the rim and top edges on the exterior. Round based bowl with slightly incurved or carinated short sides and everted or featureless rim, is the dominant shape in the ware. Some variants of the above as well as globular pitchers with long or short everted neck also occur. Graffiti marks are found on several pots. Other varieties of the ceramic industry of the age include completely black polished and red polished wares and a dull unslipped red ware. In the first two wares vessels of the types seen in black-and-red ware are repeated. Additional shapes in the black polished ware are lids with button or ring knobs, and elongated vases with pyriform bottom. Cooking pots, ring stands and storage vessels are normally found in dull red ware.

The above components are also seen invariably associated with a class of burials, well known as megaliths. The megaliths, are normally found in groups, the number in each varying from five to a thousand. More than 400 sites distributed all over south India are known (*Ramachandran, 1971*). The megaliths are remarkable for their variety in constructional and ritualistic details. Apart from custom and belief geographical and geological factors appear to have had their say in determining their forms. At present more than forty megalithic types and sub-types can be enumerated. Generally the megalithic burials are surrounded by a circle of stone boulders, and it is this which gives the name megalithic to the class of graves. They are also often covered by a heap of cairn. But the stone circle or the cairn heap appears not be invariable components of the megalithic burial ritual. Hence on the basis of the basic ritualistic feature the megalithic types can be classified as follows:

- 1) *Urn burials* : with or without a surrounding stone circle, and/or a capstone

and cairn.

- 2) *Legged sarcophagi burials*: with other features similar to No.1.
- 3) *Pit burials without any receptacles*: with other features similar to No.1.
- 4) *Rude stone dolmens*: either wholly or partially buried or seen completely above ground but closed on all sides and top; with or without cairn heap and/or stone circle.
- 5) *Dressed slab-cists*: with a port hole or without, either below ground, or partially or completely exposed; surrounded by a stone circle and occasionally without it, and/or covered by cairn.
- 6) *Subterranean rock-cut cave tombs*: Seen in Kerala and South Kanara district of Karnataka.
- 7) *Topikals and kudakkals*: These types seen in Kerala mark the spot of the underground burial pit.
- 8) *Passage-cist graves*; recently noticed in north Karnataka.
- 9) *Menhirs, alignments and platforms*: the funerary association of these is not clear.

The megaliths normally occur in separate cemeteries situated in non-arable lands away from habitation sites. They contain fragmentary secondary burials usually consisting of long bones, skull and/or a few splinters collected from bodies previously exposed elsewhere. Along with these are deposited varieties of pots and iron implements—and occasionally gold, copper and bronze objects, beads of agate, carnelian, jasper, steatite, paste and terracotta. The number and varieties of grave goods vary from megalith to megalith. Amongst pottery, the black and red ware predominates with varieties of bowls, globular pitchers with long neck, chalices, long pyriform vessels etc. The complete black and red polished wares too have the above shapes, and handled and knobbed lids. Globular pots, flat lamps, ring-stands are made of unpolished red ware. The pyriform urns and sarcophagi used as funerary receptacles are normally handmade. Graffiti marks occur on the burial pottery too. Iron implements deposited include swords, daggers, lances, crowbars, flat axes chisels, spades, hoes, sickles, bill-hooks, wedges, knives, tripods, hook-lamps and pans. Tridents, bells and horse-equipments like bit and bridle have also been found in some places. Bronze, copper and gold objects as well as beads and bangles occur only rarely. The megalithic grave repertoire is generally richer compared to what is found in the habitation sites.

On the basies of the above data, reserving various disputed aspects for further discussion, it can be generally stated that the south Indian iron age culture is characterised by three distinctive traits—the use of iron, black and red ware and megalithic funerary custom.

Chronology

The time bracket of this culture stage has been a matter of great controversy. Wheeler (1948, pp.202, 303) first put forward the suggestion that the iron age megalithic culture flourished between 200 B.C. and the middle of the first century A.D. His argument for the end date depended on the occurrence of the rouletted ware in the immediately post-megalithic strata at Brahmagiri, and the association of Roman coins in

some megalithic graves of Coimbatore district. For the initial date he depended on historical sources. He postulated a northward move of the megaliths "in the chaos which followed the death of Asoka, c 236 B.C., when the Mauryan empire melted away and a dark age settled upon Deccan for some three centuries" (*ibid*, p.202). Thapar (1957, pp.16-20) also proposed the date 200 B.C. to 1st cent. A.D. Haimendorf (1950) pointed out the inconsistency in Wheeler's theory by arguing that the Asokan edicts at Brahmagiri could not have been addressed to the primitive pastoralist neolithic folk and that the megalitic people must have arrived at the site already when Asoka issued his inscriptions. Later, probably taking these things into consideration, Wheeler (1959, p.163) revised his dating and conceded a timespan between 3rd century B.C. and 1st century A.D. A tendency to date the South Indian iron age to an earlier period started in the fifties.

Various dates suggested are 700-400 B.C. (Gordon, 1958, pp.65-67 : Haimendorf, 1954, pp.238-247), c. 600 B.C. onwards (Subba Rao, 1958, p.121), 700 B.C. onwards (Banerjee, 1962, p.180; 1965, p.10) and early half of 1st millennium B.C. (Sircar, 1955, pp.31-38). Recently Leshnik (1974, p.246), basing his conclusions on the typological similarities of finds from megalithic burials with those of the early historical period of northern India has again reverted to the late date theory. He has proposed 300 B.C. to 100 A.D. for the megalithic complex of South India.

It is to be noted however that most of the above dates are for the megaliths and not exactly for the early iron age. Many of the dates have been arrived at not just on the basis of archaeological data but also taking various theoretical considerations on the authors, origin and spread of the megalithic culture.

Two c.14 dates obtained for the Hallur site have given a fresh turn for the problem of iron age chronology (Nagaraja Rao, 1971). Both of them are from the carbon samples from the overlap phase of the neolithic-chalcolithic and megalithic (i.e. iron using black-and-red ware phase). The dates fall around 1000 B.C. These happen to be the earliest dates known so far for the iron-using culture in south India, and are practically the only dates. Another date known, for the iron age ash-pit at Tekkalakota, falls around 300 B.C. In the absence of sufficiently good number of dates that stand cross-checking, how far these few could be depended upon is not known. However, except for a small discrepancy in the Hallur dates, where in the lower layer 5 is dated (on $\frac{1}{2} = 5730$) to 955 ± 100 whereas the upper layer 4 to 1105 ± 105 , the dates are consistent when viewed in a broader back ground. If the whole series of c.14 dates obtained for different levels are taken into consideration, these dates of the overlap phase generally fall in a later period compared to those obtained for the earlier neolithic chalcolithic levels. It can also be noted that the series of dates obtained for the neolithic-chalcolithic culture from various sites in Deccan do not project beyond c.1000 B.C. Hence there would be little difficulty in accepting a date around 1100-1000 B.C. for the iron-using culture at Hallur. The introduction of iron could as well be a bit earlier, as the date obtained are for layers 4 and 5, while iron is known to occur in two earlier layers, viz 6 and 7. If the MASCA corrections are to be applied for the above dates, the beginning of the use of iron is to be placed somewhere around 1200 B.C. This possibility cannot be ruled out until otherwise established by firmer evidence. Iron could have been introduced at this time atleast in some culturally progressive pockets while the neolithic-chalcolithic culture continued to flourish in the major part of the Deccan, as revealed from C₁₄ dates for

that culture. Allowing some time gap for the widespread use of the metal, the iron age—as marking a distinctive culture-change—may be taken provisionally to have commenced around C.1000 B.C. The dates for the stages of development and the spread of the iron age culture cannot be made out. The Tekkalakota date hangs alone without proper cultural or stratigraphical context, but may just indicate a possible date of the continuation of the culture.

It is equally difficult to fix the end date of this culture phase. If the evidence of habitational sites are taken into consideration it appears that the iron and black-and-red ware using culture continued up to about the 1st century A.D.—as it has been pointed out by Wheeler (1948) on the basis of the Satavahana coins and Roman ware found associated with the immediately succeeding strata of the Andhra Culture. But some reconsideration becomes necessary on this dating due to certain historical circumstances. The existence of the inscriptions of Asoka (272-232 B.C.) at Brahmagiri, Maski and other places provides definite evidence of Mauryan rule in the Deccan. His inscriptions further mention the territories of Pandya, Chera, Choda and Satiyaputa lying to the south of his own dominion. At least by this time most parts of Deccan and south India had come under the domain of well-knit political entities. The historical sources available for the reconstruction of Mauryan rule do not mention anywhere any military expedition by any of the Mauryan kings to conquer the territories in Deccan. It is not unlikely that Deccan had come under the rule of their political predecessors, the Nandas, and the Nandas, and the Deccan came under the control of the Mauryas by imperial inheritance. So, at least by the 4th century B.C. the Magadhan rule may have spread over Deccan. The very fact that major part of south India came under a unified political entity of the Magadhan empire should have been causal for vast changes in the socio-economic and cultural situation of the region. The political stability facilitates economic growth. The contact that was established with northern India, where urbanisation had started, may have induced increase in trade and influx of cultural ideas. The introduction of the Brahmi script as seen in the inscriptions of Asoka and in the caves of Tamilnadu, the discovery of punch marked coins in Gulbarga district and elsewhere are sufficient archaeological evidences pointing towards the change. It is also known that Buddhism was introduced to south India by Asoka's missionerics, and that Jainism was brought along by Bhadrabahu and Chandragupta in about 3rd century B.C. Similarly the other religion that was well spread in northern India at the time, viz, Hiuduism, too may have made its strong impact on south India. With these it would not be incorrect to say that the establishment of Magadhan rule over Deccan marks an important event in the cultural development of South India. So the 'early iron age' can be considered as to cover a span of about six centuries from early use of iron around 1000 B.C. to the commencement of the early-historical period in about 400 B.C.

However, it should be made clear that the brackets of the age both at the beginning and end are indistinct. Cultural traits of this age are likely to have flourished before or after the time span, 1000-400 B.C. in certain culturally progressive or conservative areas also it is very likely that earlier culture patterns too survived through to this age in some geographical pockets.

This situation is to be expected to be normal in a wide territory as that of South India with its different geographical and economic areas. But several problems arise out of this when it comes to the question of reconstruction of the cultural condition of the

age. The problems start right with the selection of basic data. As there is stratigraphical continuity from early iron age phase right upto the beginning of the Christian era (Hallur, Brahmagiri, Maski, Pilkhal, etc.,), with the iron age traits continuing and overlapping with the early historic, there would be little difficulty in considering that the use of iron and black-and-red ware continued in the 1000-400 B.C. period. But the contrary may not be true ; it is not known whether all the sites with iron and black-and-red ware belong to a period before 400 B.C. In most of the south Indian sites russet coated kaolin painted ware overlaps and succeeds the iron age black-and-red ware. Russet coated ware itself has been dated to the beginning centuries of the Christian era on the basis of its association with Rouletted ware, Roman and Satavahana coins, as witnessed mainly at Arikamedu and Chandravalli. While there is probability of the iron age black-and-red ware continuing up to the 1st century A.D. in culturally conservative areas, at least in the progressive areas like the southern capitals and trade emporia of the Magadhan empire, new culture traits may have set in. Even if the indigenous black-and-red ware ceramic continued to be used there should be other criteria to distinguish the strata of the pre-early historic and the early-historic. The appearance of the russet coated-ware could be one such. The general dating of this ware to the 1st century A.D. appears to require reassessment. Recently, by a thorough analysis of the Brahmagiri evidence, Sundara (1975) has shown that the early historic phase there is to be dated to the Mauryan period. In this connection two carbon-14 dates from Bainapally (Paiyampally) in North Arcot district (*curr. sci.*, 36 p. 276) and Dharanikota, Guntur district (C^{14} data lists cyclostyled) are revealing. The carbon samples from the post-megalithic levels from these sites have been dated to c. 310 and 400 B.C. respectively. Similar evidences are also coming up from other sites. At Uraiur (*IAR*, 1964-65, pp. 25-26) the Arretine ware and some sherds inscribed with Tamil Brahmi letters similar to those found in Arikamedu are seen in a very late level above nearly 4 feet deposit of plain (non-megalithic) black-and-red ware. At Tirukkampuliyur this plain black and red ware, which is also dull and not fired, succeeds the russet coated kaolin painted ware. These indications probably attest to the fact that finely polished black and red ware is the ceramic that goes with the early iron age and that in the succeeding period the black-and-red ware underwent a change. But this aspect requires further probing. The black-and-red ware culture (in south India) is here provisionally considered as that of the early iron age.

The problem is all the more complicated with regard to the megalithic burials. No burial has been well dated so far either by radio-carbon or any other scientific method. One date from c. 80 B.C. is for the period when the megalith was disturbed and not for the megalith itself. This only proves that the megalith was in existence prior to that date. A strong evidence for the cultural association of megaliths with iron age is that they invariably contain the two iron age traits viz, iron and black-and-red ware.

While in a few sites like Brahmagiri, Pilkhal and Kunnattur the graves appear near the iron-age habitation sites, in sites like T. Narasipur no megalith has been found anywhere in reasonable proximity. Further, there are numerous burial sites without any corresponding habitation sites. But, of course, it is possible that the graves located on the unarable lands are little disturbed, whereas the habitation sites which are to be seen normally in open fields amidst agricultural lands have been lost due to continuous human activity in the region for the past two millennia. This situation of the existence of burial sites in abundance compared to fewer habitation sites has led some to consider the two

as belonging to two divergent cultural communities ; their contemporaneity has also been questioned. Leshnik (1974, p. 246) says in one place that the burials are of a nomadic people and that the black-and-red ware deposits in many sites 'were the remains of several camps regularly revisited, rather than permanent settlement'. But he continues some what inconsistently (*ibid*, p. 248) that even though the black and red ware exists as a link between the habitations and burials, it is only a cultural link and a not chronological one. Substantiating this theory he says that at Brahmagiri and Kunnattur "the excavators discovered that black-and-red ware of burials was morphologically different from that of habitations suggesting probably chronological disparity", and proceeds, "at Brahmagiri in two instances Wheeler discovered that the black-and-red ceramic stratigraphically preceded the erection of slab cists by a considerable time. But if this ceramic can not be accepted as necessarily establishing a valid link between the habitations and burials then occasional proximity of the two may as well be coincidental. The site map of Brahmagiri shows the burials within and encroaching upon the cultivated areas which seemingly rules out their contemporary use". He further points out that the absence of any architecture and other small finds in the habitation sites compared with their wealth in burials is also to be taken into consideration.

However strong the above argument may seem, when the close similarity of black-and-red ware from burials and habitations—particularly the technique, fabric shapes and common graffiti—is taken into consideration, and the fact that this pottery—a trait of the iron age—is to be seen as the single major ceramic component of the megalithic graves, their contemporaneity can hardly be considered 'coincidental'. Despite minor discrepancies pointed out by Leshnik which can be explained otherwise too, the excavation at Brahmagiri has brought forth convincing evidence regarding not only the contemporaneity but also the cultural identity of the burials and habitation. Wheeler (1948, p. 208) has listed the Pottery types that occur commonly in both the graves and the town site. Deep bowls with flat bottom, semi-circular bowls, similar bowls carinated at the waist, sagger-based dishes, similar dishes with beaded or slightly incurved rims, elongated vase, funnel shaped lid, tulip shaped vessel, sagger-based dish with straight sides and featureless rim, deep basin and carinated vase are common to both the sites. It has also been pointed out that there is no difference in fabric and texture of the wares⁴. To quote Wheeler (1948, p. 232) 'the types common to town site and megaliths occur throughout the occupational levels indicating that the forms peculiar to these represent difference of usage, not of chronology'. A similar picture emerges from the study of pottery from Maski. Thapar (1957, p. 63) says that "although specific and detailed resemblance in shapes are not many, the difference is essentially in quantity and usage and not of chronology and culture. It may not be without significance that analogues of some of the forms of this group of pottery can be found in all classes of burials individually indicating thereby a continuity and identity of the cultural equipment". The disparity in types and quantity of iron implements from the habitations and graves is to be expected naturally. While those in grave sites are intentionally deposited, in the habitations they are just accidental survivals. The iron objects from the habitations disintegrate quickly, whereas those from the protected graves, particularly from those inside the urns and sarcophagi are better preserved. Still some common varieties in the two are noticeable. From Maski, an axe from Meg. 2 has its parallel from the habitation site MSK-10 (*Thapar, 1957, fig. 35-5 and 38-25*). Similarly an arrow-head from the

burial in MSK-10 (*fig. 36-8*) and another from the same habitation level (*fig. 37-17*) may be mentioned. It may also be noted that no excavation has so far revealed any break in the continuity of the habitations to consider them as just camp sites. Hence there is little reason to doubt that the iron age people lived continuously in some settlements and buried their dead in the megalithic graves.

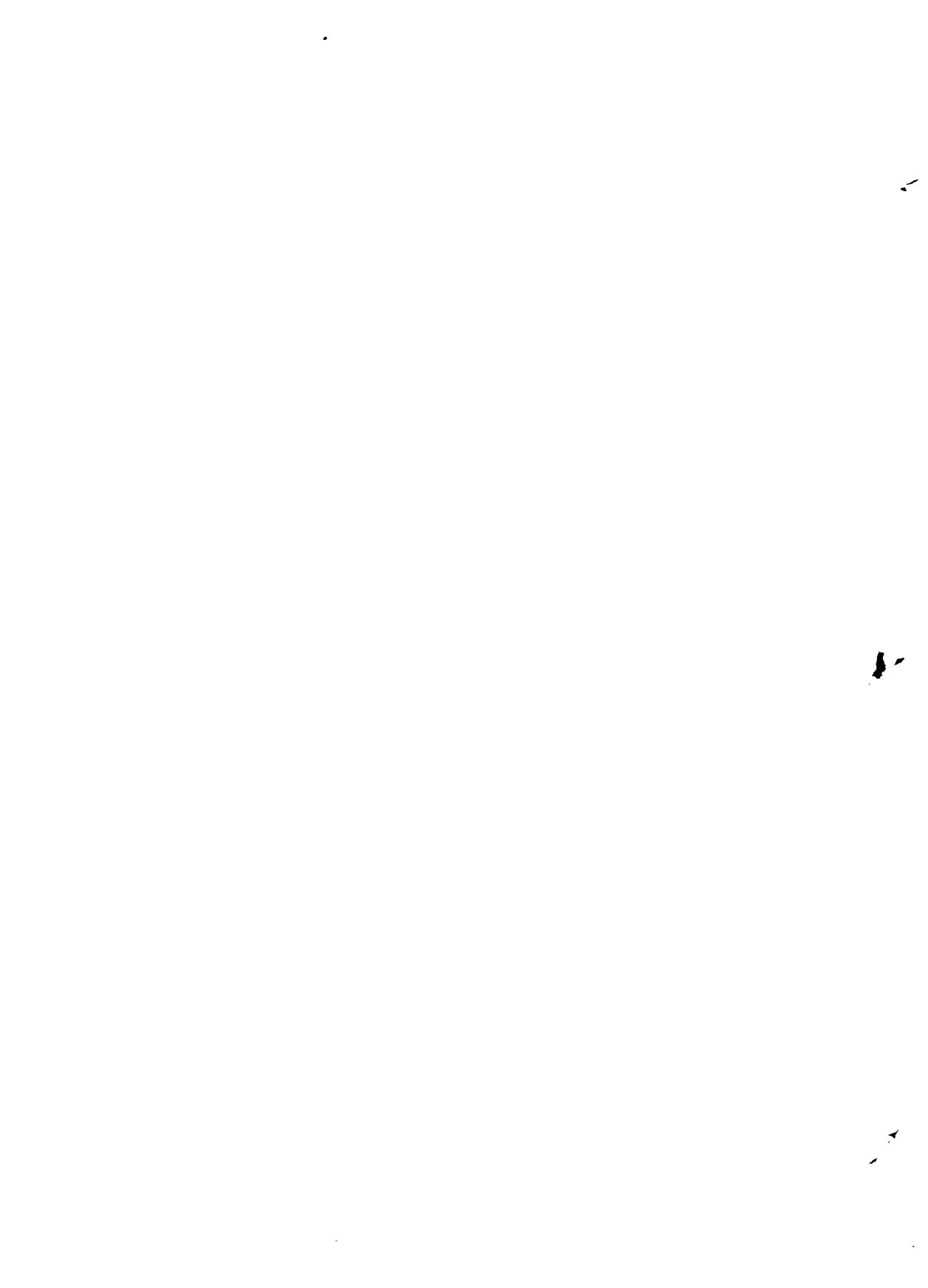
Some stray evidences are also available for the early date of megaliths and for their association with the early iron age culture. A few burials from Adichanallur, Madurai and Perumbair, contained white painted black-and-red ware (*Gururaja Rao, 1972, p. 315*). The chronological context of this ware in the far south is not known. But its occurrence in a chalcolithic context at Bahal, Tekwada, Ranjala and Tekkalakota and in the early iron-age context at Hallur may indicate possibly an early date, or at least its chalcolithic cultural affinity. Jugs with long raised channel spouts, channel spouted bowls, and a small bowl-on-stand found in graves from Perumal hills (Madura district) are considered early (*Allchin, B and F.R. 1968, p. 230*). In the famous site at Amaravati a subsidiary stupa of about the 2nd century B.C. was found built over megalithic urn burials. This not only proves that the burial is pre-2nd century B.C. but also suggest that its date must be considerably earlier from that date as the location of the buria's had been wholly forgotten by the builders of the stupa and the site was selected for the erection of the religious edifice' (*Gururaja Rao, 1972, p. 314*).

However, it should also be conceded that the practice of building megaliths outlived the iron age. Though the theory made out by Leshnik (1974, p. 246) that the whole of the megalithic complex is to be dated to 3rd-2nd century A.D. cannot be accepted completely, there could be little doubt that some of megaliths fall within this date range. The discovery of Roman coins in the Coimbatore megaliths (*Gururaja Rao, 1972, p. 313*), the existence of pottery simulating well developed shapes of the metallic vessels, the similarity of some megalithic iron implements with those from the early historical levels in north Indian sites (*Subba Rao, 1962, p. 136 ; Leshnik, 1974, p. 2 n*) etc. are clear proofs for the late age of some of the megaliths. Currently, in the absence of any acceptable internal chronology of the megaliths either geographical or typological, it is not easy to segregate the megaliths of the iron age and the post-iron age survivals. Certain new elements like the occurrence of russet coated kaolin painted ware in the Coimbatore megaliths and others may just be pointers towards this classification.

Despite these problems, we feel that for the present the evidences from the megalithic graves may also be used for understanding the early iron age culture. Three factors have guided us in this direction-(i) The contemporaneity of iron age habitations and the burials have been proved at least in some cases, as in Brahmagiri and Maski ; (ii) The iron age traits, i.e. the use of iron and black-and-red ware are invariably associated with the megaliths, thus establishing their cultural affinity ; (iii) The historical sources reveal the advent and progressive spread of northern religions and the associated socio-religious customs from about the 4th-3rd century B.C. onwards. As megalithicism is not a part of any of these religions, this should be a trait of the locally prevailing earlier culture, which in this context is necessarily of the iron age complex.

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Typology of Megaliths in South India

23

A. SUNDARA

IN INDIA hundreds of megalithic sites have been noticed from time to time largely in the deep South and the Deccan and a few in the Eastern, Central and North-Western India ever since the first discovery of a rock-cut burial chamber in Malabar by Babington. Hundreds of megaliths were dug out by antiquarians, treasure hunters etc. without proportionately fruitful results. Only that these megaliths belonged to the Iron Age and contained mostly post-excarnate fractional human skeletal remains of usually more than one individual, iron objects and a distinct pottery described as black-and-red ware, could be known. Neither cultural details about their builders nor the chronological ranges of the megaliths nor their position in the culture sequence in different regions could definitely be known. Varied, but conflicting theories regarding the builders and the chronology were put forward by several scholars.

About 200 papers describing the megaliths from the respective areas, the antiquities from them and the inferences drawn on them, are published. But no attempt was made to relate the megaliths with the nearby habitation sites of their builders. Anyway the investigations by Medows Taylor, Mackenzie, Breeks, Cole, Alexander Rea, M.H. Krishna, and a few others are particularly noteworthy for their faithful observations and attempts of classification, no matter what theories they arrived at.

It was Wheeler's scientific excavations in 1947 at Brahmagiri (Chitradurga Dist. Karnataka) that revealed unambiguously the sequential position of the megalithic culture in the Deccan and the salient characteristics. In the light of the evidences he had then, he cogently suggested middle 2nd cent. B.C. to middle of 1st. cent. A.D. as the probable date of the megalithic culture in the region. Since then, systematic explorations and excavations of megaliths and a few habitation sites are carried out as e.g. at Maski (Raichur Dist), Jadigenahalli (Bangalore Dist), Terdal-Halingali (Bijapur Dist), Hunur (Belgaum Dist), T. Narasipur (Mysore Dist) and Hallur (Dharwar Dist) all in Karnataka and at Porkalam (Kerala), Kunnattur, Amirtamangalam, Sanur (in Tamilnadu), Kesarpalli (Andhra Pradesh), Junapani, Takalghat, Khapa (in Maharashtra) Banimilia and Behara, (Mirzapur Dist), Kotia (Allahabad Dist), Burzahom (Kashmir) Kuntitoli (Bihar) and recently at Heggadehalli in Coorg, Koppa in Mysore and Puddokkottai.

To-date, there are nearly 400 research papers and reports etc. (Ramachandran, 1971

and the later publications) and four monographs (*Guru Raja Rao, 1972, Deo, 1973, Leshnik, 1974; Sundara, 1975*) exclusively on the megaliths in the Indian sub-continent. The investigations are continued. As a result of these recent researches the beginning of the Iron Age megalithic culture seems to be much earlier in the lower Deccan and is now assigned to circa 1,000-8,00 B.C. In the deep South the culture continued to flourish upto 2nd or 3rd. cent. A.D. Also many interesting details regarding the builders and their cultural traits are obtained, besides regional variations.

Megaliths

TERMINOLOGIES

As mentioned above, the megalithic monuments in the different parts of South India itself are varied both in morphological forms and to a considerable degree in contents. Also it is found that certain types are regional peculiarities, as e.g. the passage chambers in northern part of Karnataka, the Kodaikals and the topikals in Kerala, the excavated caves in the laterite plains of the western coast of Kerala and Karnataka. For a proper understanding and appreciation of the significance of the variations in the types, cultural or environmental if there be, the monuments are necessarily to be classified on a scientific basis.

The earliest attempt of classifying the monuments into distinct types was made first by the pioneer Greeks and then by Taylor. In the writings on the subject, subsequent to them these descriptive terms were freely used but often without defining them. Consequently there arose confusion in understanding correctly or in comprehending the type meant by them. Also the basis of the classification is obviously not scientific although they were reasonably and discretely used by the early writers. There arose therefore the necessity of finding out unambiguous standard terms on a scientific basis, conveying the distinct feature of the types. The Archaeological Survey of India therefore undertook a thorough field survey of the megaliths in Tamilnadu and Kerala regions. After a scientific study of the megalithic types, V.D. Krishna Swami who was in charge of this project, prepared an excellent set of terminologies for describing the types in the South. Since then these terms are in vogue, nevertheless in the light of the subsequent discoveries and researches, in these and other regions slight modifications in a few of the current terms or addition of new terms have been necessitated.

Types, characteristics and distribution

The megalithic burials may basically be classified into three groups : the Chamber tombs, the unchambered graves and monuments not actually associated with burials.

THE CHAMBER TOMBS

Before we try understand the types of this group we should know some general characteristics of a chamber tomb. The chamber is usually box-like, square or rectangular or oblong or trapezoidal on plan, consisting of a slab in upright position described as orthostat on each side. On the top is a covering slab called capstone the biggest,

kept horizontally on the orthostats. If the chamber is raised from above the ground it looks like a table. In Celtic language the word for a stone table is 'dolmen' (dol=table men=stone). In a megalithic site, a chamber may be underground or partly concealed in the ground or fully raised from above the ground. Accordingly it is described as 'cist' or 'dolmenoid-cist' 'or' dolmen. It has been noticed that in many sites chambers in all the three states or exclusively in either of the states, or in the last two states but segregated from each other, are found, as e.g. passage chambers in all the states in North Karnataka, dolmens in Palani hills, cist-circles in Brahmagiri and dolmens and dolmenoid cists in Hire-Benkal. Though geological conditions of the spots where the chambers are erected, appear to be possibly the reasons for the different states of the erections in north Karnataka they do not hold correct in the case of the others. The reasons for such preferences appear to be more cultural than environmental: a problem of further study.

A chamber may have on the entrance side a distinct passage or a hole in the orthostat known as 'port-hole' with or without a short passage for approach to the port-hole. Sometimes the interior of a chamber may be divided across into two or more sub-compartments by inserting slabs in upright positions, called transept/s. In the transept there may again be a port-hole. Thus there are many types and sub-types of chamber tombs :

- | | |
|--|---|
| (i) The passage chambers
(ii) The port-hole chambers
(iii) The oblong chambers | (iv) The topikals.
(v) The Kudaikals
(vi) The rock-cut caves. |
|--|---|

(i) *The passage chambers* : The chambers of this type are largely found in the sand/lime stone regions of the Kaladgi series particularly in the Ghataprabha-Malaprabha valleys, North Karnataka, where enormous exposures provide inexhaustible building material. They are found in about 23 localities, about 2,500-3,000 within an area of about 200 Km × 1000 km. The typical sites are Konnur, Hunur, Terdal-Halingali, Kaladgi etc.

The chamber consists of an orthostat on each of the three sides and two with a gap in between as entrance on the fourth, carrying a prodigious capstone atop. In front of the entrance is a passage of lesser height, formed by two slabs in upright position. The passage is invariably oriented to South or in between Southwest-Southeast. At the front it is closed across with a slab and a series of slabs placed flat one beside the other on the top. As the hind orthostat is usually held firmly at the side edges by the side orthostats, the latter slightly converge frontwards lest the former should collapse inwards. On the exterior of the chamber are heaped up stone rubbles upto the capstone and in hemispherical form, so that rubble packing should not allow the possible outward fall of the orthostats. At the edge of the rubble packing is a circle of stone boulders or slab lest the packing should ~~sprinkle away~~ in course of time. In some cases depending upon the size of the monuments and their relative packing there may be double concentric circles or a circle and a rectangle to hold the heavy packing. Thus the chamber upto the capstone is concealed securely in the cairn packing. If in course of time the external packing gradually disappears owing to disturbances, human or natural, the chamber stands out in bold relief and may be described as dolmen. In a passage chamber site at Konnur

many of them are with their packing missing now and are called dolmens by Burgess. But they may be cists as the chambers were artificially concealed in the packing, originally.

Two or three or more passage chambers may be erected one beside the other so closely that they together form an extensive, oblong heap described as long 'barrow.'

Occasionally, in a chamber instead of monolithic slabs on the sides, there may be small slabs placed one upon the other forming a structural wall. Thus the construction is usually orthostatic or rarely cyclopean.

As the passage chamber of the above type is well known from Konnur, Gokak Tk, Belgaum Dist. the type may be designated as Konnur type.

In a few sites such as Terdal, Halingali the plan is developed into what looks like Asokan Brahmi 'Ka' or cross type. Another type here is circular passage chamber. The chamber proper is formed by a series of juxtaposed slabs in vertical position. It has a short passage terminating at the circle. Usually it is enclosed by two concentric circles or a circle and a rectangle. This type considerably differs from Konnur type. It may therefore be designated as "Terdal type." In this type and the other there may be three or four pillars within the chamber to support the multiple capstone a noteworthy feature.

There is another type of the passage chamber. In this, the plan is irregularly hexagonal. The passage oriented to south or east or west or north is very short and of very low height. The enclosing circle is very close to the chamber and the rubble packing is comparatively thin. A noteworthy feature is that there is a small gap in the circle to which the passage terminates, which is of frequent occurrence. The chamber tombs of this type are found in a few sites, such as Kaladgi where for the first time this type was distinctly recognised and in Hallur, Rajawala in the zone of the Dharwar rocks. The type is therefore called Kaladgi type.

It is interesting to note that on the part of the builders there is a tendency of using a particular stone for a particular part of the structure. Sandstone or rarely laterite slabs are used for the chamber proper, while well-cut laterite or conglomerate blocks, for the enclosing circle.

Excavations of a few-passage chambers of Konnur type in Terdal, Halingali and Hunur revealed that the tombs were previously disturbed and they contained post-excarnate skeletal remains, pottery, and iron objects, suggesting that the tombs were family burial vaults.

Outside Karnataka, distinct passage chambers have not so far been reported from any of the other regions. However, the chamber tombs at Mamandur are comparable to those of Kaladgi type. The chamber is ovaloid in plan formed by boulders and thick blocks having a short passage in front terminating at the enclosing circle. In Sanur, the megalith-3 described as dolmonoid cist is similar to Terdal type.

(ii) *The Port-hole chambers*: The chamber tombs of the type occur in very large number over a very large part covering the four regions : Karnataka, Andhra, Tamilnadu and Kerala, from Pochmpad Adilabad Dist Andhrapradesh to Pudukottai-Palani in Madurai-Coimbatore area, Tamilnadu, in the north-south and from Halshi near Belgaum to Chittor area, Andhrapradesh, in the east-west. The sites are located in the vicinity of the distinct exposures of the chains of hills of the Peninsular granite-gneisses rocks.

In this type, while the plan of the chambers in the Aihole-Rajankolur area, North

Karnataka also of those in some of the sites Western Ghat and Coastal region is similar to that of the Konnur type, that of the others is what is popularly known as 'swastika' or clockwise or contra-clockwise, i.e. one side edge of each orthostat laterally outstretches the other. In the latter case therefore none of the orthostats can not fall inwards. Thus the plan appears to be an improved method over the former, which is likely to be of chronological significance as well. The plan of the oblong chamber is mostly of Konnur type. The chamber may be of either slabs or boulders. The chambers may be either cists or dolmenoid cists or dolmens. Further, there is usually a port-hole in one of the orthostats. They are accordingly described as port-holed-cist, dolmenoid cist, dolmen.

In some sites the port-holed cists/dolmenoid cists, have circular port-hole invariably in the southern/eastern orthostat. Very rarely the port-hole is U-shaped. Externally the port-hole is closed with a slab. In the front there is invariably a short passage. The chamber exteriorly is packed with rubbles which in turn is bound by circle.

The chambers of this type with the plan of Konnur type and port-hole in the southern orthostat are exclusively found in Aihole-Rajankolur area. This type is named as 'Aihole type'. And chambers of the type having swastika plan and port-hole invariably in the eastern orthostat are found in large areas in Brahmagiri, Kolar and Chittur areas. There is another particular feature worthy of note in this case. The rubble packing is circular and systematically coursed curling inwards towards the capstone. The circular coursed wall and its gradual inward curling ensures far better and more stable force against the possible outward collapse of the orthostats than the simple heap of rubbles would do. The excavation of cist-circles (i.e. port holed cists) at Brahmagiri has revealed clearly all the architectural features of this type. Hence the type is designated as 'Brahmagiri type', a well developed type unlike the "Aihole type." It may also be noted that port-holed cists/dolmenoid cists of the Aihole and Brahmagiri types, are usually of uniform size.

In a few of the sites with either of the above two types, there are port-holed dolmens mostly or dolmenoid cists different in many respects from the above two types. The port-hole is usually circular but rarely semi-circular located in the centre or side or bottom edge of any orthostat and of varied sizes. Further, the port-hole is closed externally with a slab of any size, but has no approach passage. On the exterior of the chamber there is thin rubble packing which is enclosed by a wall of stone slabs placed upright one beside the other and resting against the capstone or rarely by a coursed circular wall. As a completely intact example of the circular wall is not noticed, if it was raised upto the capstone is not known. Like the Aihole and Brahmagiri types, these port-holed dolmens and dolmenoid cists from the point of view structural development, are correspondingly of two types "Rajankolur" and "Hira Benkal" types. The chambers of both the types remarkably very in size. Chamber tombs of the former type are found in many sites in the Western Ghat and Coastal areas of Karnataka, Kerala and Tamilnadu as, e.g. Kajekaru, Porkalam, Palani and those of the latter, in northern and southwestern Andhra and northeastern Tamilnadu as for instance, Pochampad, Souttoukeny.

✓ In Pudukkottai are, the transepted cists are very common, perhaps of Hira Benkal type.

With regard to the dolmens with or without port-hole in Palani, it is indeed note-

worthy that they are grouped in varying numbers in enclosures roughly circular or trapezium quadrilateral on plan. And the dolmens within the enclosures are arranged in parallel rows or radially.

Excavations of the port-holed cists of Brahmagiri type at Brahamgiri and of Hire Benkal type at Pochampad, Yeleswaram and Souttoukeny, have no doubt yielded post-excarnate human bones of more than one individual, pottery of the usual fabrics and iron objects in large quantities.

(iii) *The oblong chambers* : The chambers of this type are found mostly in north-eastern Karnataka and the adjacent central Andhra i.e. Telangana part. The sites are located in limestone zone of the Bhima series and in the Peninsular gneissic zone. They are mostly cists, but rarely dolmenoid cists. The typical sites are Jewargi, Maula Ali, Raigir, Hashampet, Nagarjunakonda. At HireBenkal the dolmenoid cists are of varied sizes.

The oblong cists has a heavy rubble packing at the ground level, bound by a circle. In between the rubble packing and the cist in the pit is a layer of dug out earth. The cist in some cases, is divided lengthwise into two or more sub-compartments by transverse slabs, but carries a single capstone usually. Regarding the interlocking of the orthostats no particular method was adopted. Either one or both the orthostats on the longer sides may outstretch those on the shorter sides. The orthostats of one of the short sides is sometimes higher perhaps to check up the sliding away of the capstone on that side or to facilitate the lifting of the capstone at the opposite end. In none of the excavations earlier or recent the cists is found to have a port-hole. But at Hire Benkal, of the several dolmenoid cists only one has a port-hole. Similarly a few of the oblong cists in Jewargi has a non-functional passage in the rubble packing. Excavations of the oblong cists in Nagarjunakonda and Yeleswaram have provided similar results as those of the above ones ; interment of post-excarnate sketelal remains of more than one individual, pottery, iron objects etc.

(iv) *The Topikals* : Chambers of this type are found in the laterite plains of the Malabar part of Kerala region. They are usually found in small number in any of the sites known. As the chamber is conical in profile carrying a low convex circular capstone, looking like a hat on the truncated top it is locally called 'Topikal' (= Hat Stone). Four plano-convex triangular cut stones with the tops truncated, are fixed in an inwardly inclining position so as to leave no gap vertically in between. On the truncated top is placed, a well cut and dressed hemispherical capstone. Externally at the bottom it is paraboloid and internally, roughly rombhus, in plan. The c'inostats and the capstones are well cut and dressed so much so when they are erected in required fashion, no space should be left between any two of them. The cutting and erection therefore imply at least empirical arithmetical calculations :

The typical sites are Cheramanangad, Ariyanur, Kolappuram. No scientific excavation of this type has been carried out.

A varied type of the Topikal, is found at Cheramanangad. In this instead of four there may be 5 to 12 such clinostats fixed in the same manner as that of Topikal obviously enclosing a larger area. At the top, they can not touch one another. How the top was covered is not clear. This type is designated as 'Multiple Hood Stone'.

(v) *The Kudaikals* : This megalithic type consists of a burial pit covered at the top with a roughly plano-convex capstone of laterite. The shape of the capstone resembles the

handless umbrella made of Palm-leaves. The type therefore is locally described as "Kudaikal" (=Umbrella Stone). Porkalam, Kolappuram Koduvayur, are some of the type sites.

(vi) *The Rock-cut caves* : In the laterite plains of Malabar (Kerala) and South Kanara (Karnataka) there are many sites with underground chambers excavated in the rock. Some type sites are : Chovvannur, Kakkad, Kattakampal, Aralam, Kalyad, Chitrari, Udupi.

The most simple is a hemi-spherical dome with an opening at the top looking the sky. In this case from the surface a circular pit is excavated deep which is, after some depth, about a meter, gradually widened till the required depth about 3 m. from the surface is reached. The floor is even and circular in plan. Or, a rectangular pit is excavated leaving cut steps on one side. On the opposite vertical side rectangular opening is cut to some depth. Thereafter horizontally the excavation is continued to the required area, leaving stumps for making benches and stands for placing pottery thereon. In some cases there may also be a central opening looking the sky, or pillar, in the chamber. Similar chambers may be excavated in either of the other vertical sides or the both of the open rectangular pit or court. Thus such caves are multichambered.

It was observed by Sri K John of Calicut University in a site at a Chitrari, Wynad, that a chamber may be excavated through the top opening and subsequently the rectangular court on the side may be excavated from the vertical side of which an opening is cut into the chamber. Usually the top opening is closed with a granite slab.

Further, on the surface beneath which is the excavated chamber, is cut a circular ditch enclosing the chamber reminiscent of a stone circle.

In Chitrari, very close to some of the caves, there is a pit cut in the rock, roughly trapezium in plan, about 1.80 m long, 27 cm and 48 cm wide near the ends and 55 cm deep, approximately east-west oriented, evidently forming part of the chamber tomb. A human body in lying posture can easily be accommodated. Was it therefore meant for primary disposal of the dead ?

Excepting that of a hemispherical chamber, the plans of any of these sub-types of the chambers, are irregular : roughly rectangular, elongated semi-circle, or circular. The opening to the chamber, cut in the vertical side of the court may look any direction. There is therefore no particular orientation for the entrance.

Although chambers of this type are not scientifically excavated so far, the pottery and iron objects of the earlier collections, suggest their genetic relation with those of the above types.

THE UNCHAMBERED BURIALS

In this group the types are :

- (i) The pit-burials
- (ia) The pit-circles
- (ib) The barrows
- (ic) Menhirs
- (id) The cairn stone circles
- (ii) The terracotta sarcophagus burials.

(iii) The urn burials

Excepting the last two the others are found over a wide part comprising all the regions of South India and in any of the geological zones. Urn burials are found largely in Madurai-Tirunelveli area, northern Kerala and southern Karnataka. And the last type occurs in considerable number in Chingleput-Bangalore area.

(i) *The Pit-burials* : This type is quite simple consisting of an ovaloid or oblong or cylindrical pit dug into the ground, containing skeletal remains, pottery of the usual fabrics and iron objects.

Broadly they may ^{be} divided into sub-types :

- (a) Pit-burials usually elliptical on plan containing single skeleton, extended articulated, in north-south orientation the skull being towards north, on ash bed, with a few pottery and iron objects of fewer types such as arrowheads and knife. They may have indistinct and feeble lithic appendage, on the surface and are located within the habitation.
- (b) Pit-burials elliptical or cylindrical, containing post-excavate, secondary and multiple skeletal remains with more pottery and iron objects in moderate number. They exist outside the habitation.

In the excavations at Maski, examples of the first type classified into two types B(i) and B(iv), were found for the first type. Elsewhere such burials are few and for between e.g. Megaliths XIV and XV at Nagarjunakonda probably those in Pudukkottai. But for the pottery and iron objects, all the other characteristics are exactly the same as those of the chalcolithic burials of the Deccan.

Burials of the second type particularly of cylindrical sub-type, are common in North Karnataka. In some sites as e.g. at Gaudageri-Unachageri they have indistinct rubble packing at the top of the pit. Within the pit skeletal remains are placed inside one of the big pots or outside. It may be noted here burials of this type are different from the Urn-burials of the deep South in two respects : no exclusive use of special pot i.e. thick sectioned coarse large sized pyriform Urn and placing of the skeletal remains even outside the pot within the pit.

(ia) *The Pit-circles*: In this case Pit-burials of the second type described above, are made distinct by adding to it a stone circle having no heap of rubbles i.e. cairn packing within, on the surface, with the pit at the centre. The Brahmagiri pit-circles illustrate the type well. The oblong circle in Kodaikanal excavated by Aiyappan may belong to this class.

(ib) *The Barrows* : Another variety of the second type may have a prominent cairn pacing right over the pit-burial, but without bounding circle. The barrows may be either circular or ovaloid on plan. Burials of this sub-type are found extensively in Karnataka, Kerala and Tamilnadu. Although no specimen of the type is so far excavated, some disturbed barrows clearly indicate their characteristics.

(ic) *The Cairn stone circle* : In this variety, the pit-burial is distinguished with heavy cairn packing of considerable depth or thin spread of rubbles, bound by stone circle. The pit may be rectangular or circular or irregular on plan. The cairn of the burials in North Karnataka and Andhra, is strikingly heavy while that of those in Tamilnadu, thin. The cairn stone circles in Jewargi, Maski, Yeleswaram on the one hand, the

Megaliths 4 and 5 in Sanur respectively demonstrate the variations in this feature.

(i) *The Menhirs* : Menhir simply means long (or tall) stone in Celtic language. In Kerala, and in some parts of western and southern Karnataka simple pit-burials of the second type are found to carry at the top a huge rough stone slab in upright position or slightly inclined on a side. There are only a few sites as e.g. Alapara, Kuttur in Kerala and Nilasakal, Karnataka. Two menhirs in Bison valley and one in Alappara were excavated. They were having pit-burials beneath. Similar menhirs are found in Murardoddi and Reverala, Andhra. But their exact nature and function are to be known from excavation.

(ii) *Sarcophagus burial* : Sarcophagus derived from Latin word, means eating flesh. That which is supposed to eat away flesh from the human body after the body was placed in it, is sarcophagus i.e. reducing the dead after interment to the skeletal form. In many of the megalithic burials are found boat shaped burnt clay (=terracotta) troughs often with two rows of hollow legs ranging from 4 to 12 luted to it at the bottom and having separate lid to cover, containing pottery, iron objects and in some cases, human skeletal remains. The Jadigenahalli megaliths contained terracotta sarcophagi. Pallavaram, Sanur Gajjalakonda, Feroke are typical instances for the use of sarcophagus with legs and without legs.)

A ram-shaped sarcophagus from Sankhavaram near Porumamilla, Badvel Tk, Cuddapah Dist. is curiously interesting, and assigned to megalithic context, in view of the types and characteristics of the associated antiquities, particularly pottery.

(iii) *Urn-burials* : This is the most common type represented in the largest number in Tirunelveli and in the adjacent districts of Tamilnadu and Kerala. Generally a pyriform huge urn of thick, coarse section with bulgeous body and truncated bottom contained human skeletal remains or the whole skeleton and other burial pottery etc., is found in a pit. At the top above the mouth of the urn may be placed a stone slab. The Adichanallur urn-burial site excavated by Alexander Rea is well known. In Chingleput region, medium sized, urn burials with one or two or more pyriform urns are found in the burial pits that may carry cairn at the top. Porkalam and Amirthamangalam are respective instances in this regard.

Recently, Urn-burial of the first type has been found in South Kanara.

MONUMENTS ; STONE ALIGNMENTS

A stone alignment is a series of huge boulders (or very rarely slabs) aligned in parallel lines in a particular pattern. In about 12 localities in Raichur and Gulbarga and in many in the adjacent Mahbubnagar and Nalgonda districts, of Karnataka-Andhra region, are found stone alignments. In these sites, the upright stones are bouldery mass of granite-gneiss usually in large numbers set up at regular intervals in several parallel rows in particular patterns : diagonals and squares. In these patterns, from any direction the upright stones are found in lines. The only known exception with regard to the form of material is the stone alignment at Murardoddi (Mahbubnagar Dist), the upright stones of which, are quarried slabs. The most extensive site is at Hanamasagar. Shorapur Tk, Gulbarga Dist., having approximately 1,000 upright stones.

In the vicinity of most of these sites, are megalithic burial sites. In one or two, sites stone circles are found within the alignments as for instance at Vibhutihalli. Their erec-

tions in a particular arithmetical pattern covering much larger area would not suggest them to be memorials as well.

Excavations of a part of a stone alignment each in Piklihal and in Maski revealed that they are not associated with burials, or form a part of megalithic architecture of burials.

In view of the rough and undressed character of the upright stones and their proximity with the megalithic sites, they are supposed to be of megalithic tradition. However, the source, cultural affiliations and chronology of the alignments, are yet to be known.

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Early Iron Age in the Northwest of Subcontinent

24

G. STACUL

THE FIRST excavation carried out on a systematic basis permitting to throw light on a chronological sequence in the north-west regions of the subcontinent, in protohistoric periods, was supervised by Sir Mortimer Wheeler at Bala Hisar near Charsada in the Peshawar plain in 1958. Wheeler, 1962.

A particularly significant piece of information evidenced by this excavation is that "right down to the earliest level of Bala Hisar iron was in use".

Wheeler has provisionally referred the earliest settlement phase at Bala Hisar to about the middle of the 6th century B.C. Since he maintains that it is possible to correlate the introduction of the use of iron-working in the subcontinent with the invasion of the Gandhara region by the Achaemenids in the time of Cyrus or of Darius.

The most characteristic features of the earliest settlement phase at Bala Hisar (Charsada I, layers 51-41), are some recurrent well-defined key forms and fabrics in the pottery : the 'rippled rim' and the 'soapy red' wares. Among the vase shapes, the following ones may be especially distinguished : the large vases with short flared rim, the large vases with high funnel-mouth, the cordonated bowls and the bell-shaped vases with low carination and disc-base.

Further excavations in the Swat Valley and in the Panjkora Valley, that is in the mountain regions lying to the north of the Peshawar plain, have led us to recognise here also the key-forms and fabrics typical of the earliest layers of Charsada. Particularly in the Swat Valley, where a sequence of chronologically and culturally different protohistoric periods has been identified, the same stylistic horizon may be allocated to a period stretching from the end of the second millennium to the beginning of the first millennium B.C. (middle-late phase of the Period V in the Ghaligai and Aligrama sequences) (Stacul, 1969a).

In the Swat Valley, only a single iron find has been ascribed to the Period V. It is a fragment of a laminar, highly oxidized object collected in the grave No.126 of the Katelai graveyard. The object was discovered at the feet of an inhumed body, near a grey biconical vase with disc-base. This vase is of a type which is found only in the earliest phase of the Period V in the Swat Valley, where it probably disappeared before the end of the second millennium. (Antonini, Stacul, 1972, Vol. I, pp. 322-323, for grvae

126 ; Vol. I, p. 24, fig. 8c and Vol. II pl. 17a and b for the gray biconical vase).

In the protohistoric graveyards of Loebanr, Katelai and Butkara II in the Swat Valley, where 475 graves have been excavated, no other iron finds ascribable to the Period V (the graves of this period amount to 136) or to the Period VI (159 graves) have been discovered. The numerous metal finds from these graves-with the only exception we have already indicated-are always copper objects.

It is only in the Period VII, going back not before the 4th century B.C., that graves were provided not only with copper objects, but also with iron metal ones. We can even state that the most characteristic feature of the Period VII in the Swat Valley is, namely, the sudden large presence of iron metal objects. Out of a total of 56 graves dating back to this period (*Fig. 1*), more than a half yielded iron metal objects. It should be noted that, owing to the development of iron metallurgy, absolutely new types of implements and objects, not documented in earlier periods, were introduced in Swat, especially as far as weapons are concerned (*Fig. 2*).

These evidences have essentially been substantiated by further excavations at the settlement site of Aligrama, near Mingora, where several development phases of the Periods V and VI are documented. At Aligrama no iron find came from layers of the Period V. The earliest evidence of iron metal objects has occurred in layers ascribed to the late Period VI, supposedly between the 5th and the early 4th century B.C. They are three fragments of pins (inv. A.52, A.53, A.70) and a laminar object of an undefinable shape (inv. A.54).

Similar documentations are yielded by the excavations the University of Peshawar has carried out in the lower Swat (graveyard of Thana) and in the Panjkora Valley (graveyard of Timargarha), where in the graves with iron finds there are vases and objects almost identical those typical of our Period VII.

A further corroboration is given by the excavations we have effected in the Buner and in the Chitral regions, where iron objects have always occurred in graves provided with a furnishing showing a close similarity with that usually found in the Period VII in the Swat Valley (Dain, 1967; Stacul, 1967, 1969b).

Consequently, the conclusions that the Iron Age in the Swat Valley and in the adjacent mountain regions did not begin before the 4th century B.C., can be drawn. It is indeed only in the 4th century B.C., in the Period VII, that the spreading of iron-working has determined, in the Swat Valley, the introduction of new types of objects and caused consequent inevitable changes in working method; and in weapon use. It has thus marked the beginning of a new era. The scanty and occasional occurrence to iron finds in earlier periods certainly of significance if the objects were actually produced by a locally developed metallurgy, has not changed. In the main, the overall picture of local cultures, where metal products consisted predominantly for a long time of small copper objects.

The problem is perhaps somewhat different in the Peshawar plain, where Wheeler has collected evidence on the occurrence of iron materials even in the deepest archaeological layers of Charsada. Wheeler has provisionally ascribed the earliest settlement phase at Charsada to about 550 B.C. on the basis of the assumptions we have previously indicated. However the similarity between the pottery from these layers and that typical for the Period V in the Swat Valley and the adjacent regions is so close and clear that it is quite probable that the date of the deepest archeological layer of Charsada is earlier

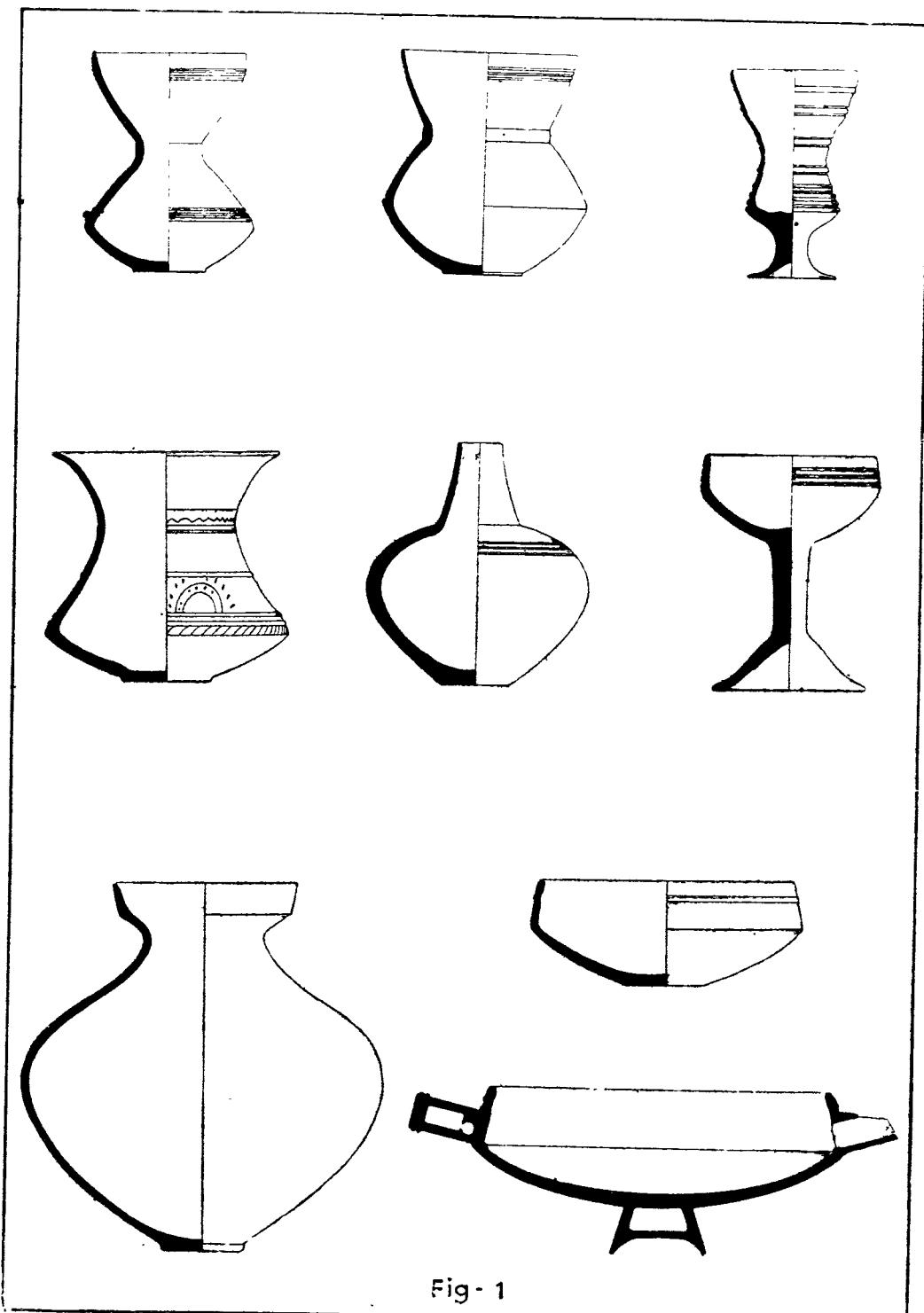


Fig - 1

Fig. 1 Pottery from graves of the Swat Valley, Period VII

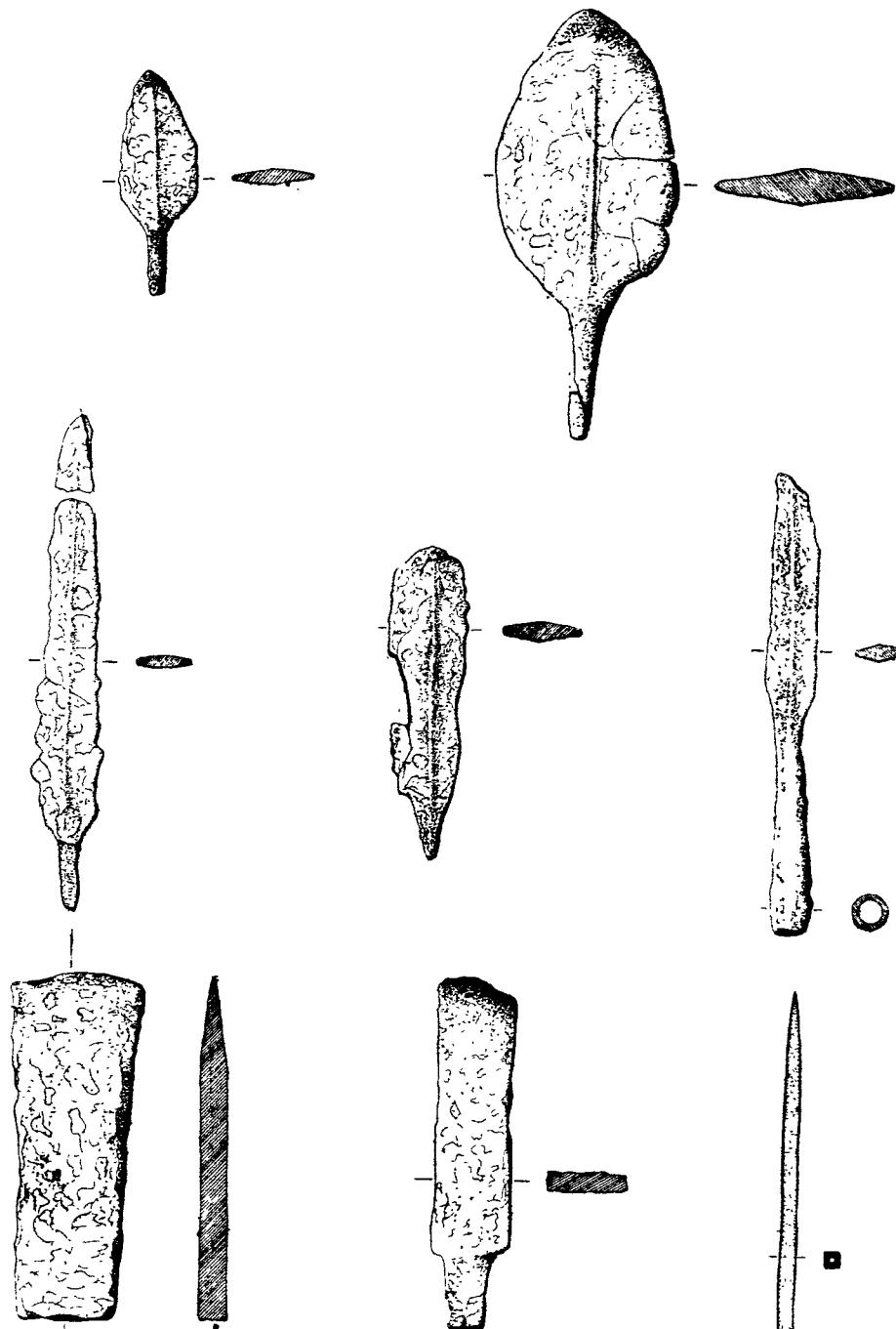


Fig. 2

Fig. 2 Iron objects from graves of the Swat Valley, Period VII

than that previously assumed.

Anyway, a further corroboration of these statements may be given by the excavation of the protohistoric graveyard of Zarif Karuna, recently discovered by the Archaeological Department of Pakistan about 17 kilometres north-west of Peshawar (*Pakistan Archaeology* 8, 1972). The Department has kindly allowed me to look over the furnishings of some of these graves. In this way, I was able to confirm that some are correlated with wares and finds coming from graves recorded in Swat during the Period V (e.g. the graves with 'face-urns' containing semi-combusted bones). On the contrary, others are similar to grave furnishings documented in the Swat and mainly in the Buner in the Period VII. The full documentation of the finds at Zarif Karuna will show whether iron objects-recurrently evidenced in the graveyard-occur only in later graves or are found also in earlier periods, thus supporting the data Sir M. Wheeler collected in the nearby Charsada.

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*Early Iron Age in the
Indian Northwest¹*

25

DILIP K. CHAKRABARTI

I. Iron Ores and Pre-industrial Smelting

A COMPREHENSIVE summary is available in Valentine Ball (*1881, pp. 402-404*). In Sind the most important source is the passage beds between the Kirthar and Ranikot groups northwest of Kotri, especially near Laniyan and east of Bandh Vera. The beds, sometimes 15-20 feet thick, are not often adequately ferruginous, but there are significant occurrences of magnetite, red and brown haematite in places. The beds continue west and southwest of Jhirak, but with a lesser iron content. There are ferruginous rocks also at the base of the Manchar group where the latter rests upon the Kirthar limestone near Bandh Vera and at the base of the Laki range. There is a clay iron-stone in the Tertiary rocks of the Bolan. A limonitic ore exists in the hills of Waziristan and there are also records of its pre-industrial smelting. One particular area called Kanikagram is specifically noted because of its local reputation as an iron-smelting centre which was visible in the form of furnaces, slag and stores of ore in the local villages. Magnetite and haematite occur in the Hazara country and there are iron ores in the form of an earthy haematite to the southwest of Bannu. The Bannu ore was locally in great demand for making nails, cooking utensils etc. In the Peshawar area a black magnetic iron sand was collected from the neighbouring Bajaur and used for the markets of Peshawar and Kabul. One of the reasons for which it was smelted in Peshawar was the making of gun barrels. The fact that there were pre-industrial iron smelters in the area suggests that the manufacture of early iron objects could depend on the regionally or locally available ore.

II. Scope of the Present Survey

The geographical areas involved are Baluchistan and the valley of the Swat and her tributaries. In Baluchistan there is only one relevant site, Pirak in the Kachhi plain. This has not yet been related to any other site in the area or elsewhere. The cairn-burials of Baluchistan generally find a place in Indian Iron Age studies. A close analysis of the

1. "India" in this context denotes India before 1947.

existing data, however, points to a historical date. In the Swat area most of the sites are grave sites covering a wide range of time in which the date of the first appearance of iron is not yet very clear.

III. Baluchistan

A. PIRAK (*Jarrige and Enault, 1973 ; Casal, 1973 ; and 1970*)

There is no major break in the sequence of this site, about 20 kms. south of Sibi in the Kachhi plain. The number of its occupational levels (marked from the top) is 11. Iron appears in the level 6 but in a 'small quantity' (no detail published). Its use increases in the levels 4 and 3. Several 'two-winged arrowheads' have been found; 'one was lying with bits of iron, mixed with a huge quantity of ashes, near a small apsidal oven' (*Jarrige and Enault, 1973, p. 167*).

Serrated stone blades from the earlier chalcolithic level continued in use. Two of the earlier three chalcolithic pottery types—basically a bichrome type—continue to occur, though the painting style is said to be cruder. A new ceramic element is a grey or black pottery, apparently wheelmade and often burnished. Its common shapes are carinated bowls and dishes, some with 'horizontal stud-handles'.

About 1000 square metres of the level 4 have been exposed. The plan is not yet published but the basic component is said to be a set of rooms connected by doors and steps within an enclosing wall. Wood was used for lintels of niches and doors. There were ovens and fire-places and also half-buried jars inside the houses. The houses are rebuilt in the level 3 with more fire-places and ovens which coupled with an increasing number of artifacts (nature unspecified) suggest 'craftsmen's activities'. There are some terracotta seals with compartmented designs and beads decorated with zigzags and circles. An important feature is a large-scale preparation of bone points, mostly of antler and often decorated with an incised circlet on each side. No copper object seems to have been found in the iron-bearing level. The upper levels, 1 and 2, are mostly a mass of ash, crude pots and ovens, but one notes a well lined with wedge-shaped burnt-bricks and also a 5 cm. high, well-finished terracotta head in the level 2. Three radiocarbon dates are available for the Iron Age occupation at the site : TF-1108 and TF-1109 from the level 4, and TF-861 from the level 5. The dates are (successively) : 755 ± 105 B.C. (820-840 B.C.), 810 ± 125 B.C. (900 B.C.), 785 ± 105 B.C. (850-880 B.C.). A radiocarbon date of about 800 B.C. (880-900 B.C.) for the beginning of iron at Pirak seems to be acceptable.²

Two points may be noted about the beginning of iron at Pirak. First, this does not bring about any break in the cultural sequence. There is a significant element of continuity in the use of earlier pottery types and stone blades. Secondly, the number of so-called 'fire-places and ovens' suggests local smelting activities.

B. CAIRN-BURIALS

The cairn-burials of Pakistani Baluchistan and Makran, which are distributed also

2. The dates within brackets are corrected dates according to the MASCA calibration chart. All radiocarbon dates cited in this paper are from Agrawal-Kusumgar, 1974.

in Iranian Baluchistan and Makran and extend in that country up to Fars and Kirman, were first noted by Major Mockler in 1876 in the lower Dasht val'ey near Gwadar on the Makran coast. Mockler's four sites—Damba Koh, Darmani Ban, Jiwanri and Gatti (*Mockler, 1876*)—were re-explored by Aurel Stein who also discovered similar burials in the Zhob-Loralai area of northeast Baluchistan. In his expeditions Stein (1929, 1930, 1936, 1937) traced their distribution up to the Kirman and Fars areas of Iran. Apart from a limited work at Sar-i-Asiab near Kirman by C.C. Lamberg-Karlovsky and James Humphries (1968) there has been no basic field-work on these burials since the work of Stein. Possibly the only other relevant work is that of Walter A. Fairservis, Jr. on a cairn site in the Quetta valley (*Fairservis, 1956*, p. 196; site Q 10).

1. Cairn-burials Sites

As a complete list of reported sites (cairn-burials) and the nature of work on each of them is not available in any publication it should be worthwhile to draw up such a list. The starting point of this list is the sites in the Zhob-Loralai area of Pakistani Baluchistan. The terminal geographical point is Bushire on the Persian Gulf. The sites are :

1. Periano Ghundai (*Stein, 1929*, p. 49)—reference to “numerous” stone circles but none was excavated.
2. Moghul Ghundai (*Stein, 1929*, pp. 46-49)—about 100 cairns, 60 excavated. The usual finds were pieces of bone and fragments of pottery. The pottery was invariably plain and coarse. Among the shapes are a handled jar with S-profile, a short necked ovoid bowl and a flat, flask-shaped vessel. The metal objects comprised at least 10 iron arrowheads, 1 iron spearhead, 1 bronze jar on a tripod, 3 bronze ‘cat-bells’, 3 bronze rings and 1 silver ring. One of the bronze rings had a bezel of pointed oval shape showing in intaglio a couple recalling the treatment of such figures in the Kushan-Gupta phase of Indian art. A small pot showed Classical designs like rosettes, intertwined festoons and medallions. One may also refer to a jade bead and a wooden comb.
3. Chaperkai hill (*Stein, 1929*, pp. 54-55)—only 3 cairns examined. They revealed nothing except fragments of bones and pottery.
4. Tor-dherai (*Stein, 1929*, p. 70)—no work done.
5. Sur Jangal (*Stein, 1929*, pp. 76-77)—the interesting thing was the occurrence of some sherds of chalcolithic pottery and a stone blade inside a few cairns. There is every possibility that these sherds and the blade were unassociated finds. It is also possible that these objects got mixed up with the soil filling of the cairns.
6. Zayak (*Stein, 1931*, p. 34)—a few cairns were cleared but revealed only soft earth.
7. Nal village (*Stein, 1931*, p. 169)—no work done.
8. Abdul-But ridge (*Stein, 1931*, p. 175); this site is called Panju Damb in *Lamberg-Karlovsky and Humphries, 1968 fig. 3*)—no work done.
9. Nokjo-shadinzai (*Stein, 1931*, p. 153)—only a few bone fragments and a coarse plain ware.
10. Mazena Damb (*Stein, 1931*, p. 149)—the only interesting discovery seems to be that of a handmade jar which contained, besides small calcined fragments of human bones, two charred date stones.

11. Kulli (*Stein, 1931, p. 119*)—this site had on the eastern slope of its chalcolithic mound some stone circles which yielded fragments of calcined bones and pieces of pottery.
12. Zangian (*Stein, 1931, pp. 86-88*).—490 cairns were counted in all but the number may be more. They lie on the crests and slopes of two ridges on the east and west sides of a river bed, the Sorab Kaur. 69 cairns were opened. Small pieces of human bones and plain pottery of reddish colour constituted most of the finds. In 10 of the cairns examined the vessels were placed near the eastern end of the enclosed space. The basic shapes of the pots were spouted, lugged and flask-shaped vessels, occasionally painted with scrolls, volutes etc. The metal objects comprised a badly rusted and broken large iron sword blade and another smaller and similarly damaged weapon of iron, which might have had a bronze fastening at the hilt, besides fragments of copper and iron. Among other finds were a decorated bone piece, a few stone beads and possibly a terracotta toy. One may also note the discovery of horse's head in 2 cairns.
13. Bit (*Stein, 1931, p. 88*)—mere report.
14. Kalatuk (*Stein, 1931, p. 56*)—11 cairns. Mere report.
15. Nasirabad (*Stein, 1931, pp. 85-86*)—72 cairns, 6 of which were opened and revealed small pieces of bone, 3 pots of coarse red ware with a whitish surface and small pieces of some iron implements.
16. Suntsar (*Stein, 1937, pp. 71-72*)—a small group of cairns lie on a gravel terrace overlooking the Dasht river. 6 of them were opened and revealed, apart from bones, a stemmed pottery bowl, potsherds, a wooden comb and “fragments of clear white glass”.
17. Gatti (*Stein, 1931, pp. 74-75 ; Mockler, 1876*)—Out of about 50 cairns at this site Mockler examined 6 and in 3 nothing but pieces of bone were found. In the rest there were some pottery (one pot at least was loop-handled and spouted), fragments of an iron pot, some decomposed iron and a green glazed bottle. Stein's exploration revealed some more pottery but otherwise almost nothing new except fragments of a small copper or bronze vessel.
18. Jiwanri (*Stein, 1931, pp. 77-82 ; Mockler, 1876*)—the number of cairns estimated by Mockler was 300-400 but Stein found about 200. Mockler opened 9 circular and 2 square cairns. In 3 of the circular ones and 1 of the square ones nothing but some fragments of bone were found. The others revealed the following objects in addition to bones : fragments of pottery, a small rounded pot, a flask-shaped pot, a piece of stone for sharpening knives, a shell ornament, two copper bracelets with snake-head pattern, a copper bracelet without any pattern, a copper lamp or censer, fragments of a copper vessel, a carnelian bead and some scraps of iron. Stein opened 178 cairns in 4 days. Apart from pottery he found two copper bracelets, a copper ring with a bezel, some thin and small silver rings, a carnelian bead, an iron fish-hook and, some fragments of small iron implements.
19. Take-dap (*Stein, 1931, p. 76*)—apart from lugged pottery and bones the only interesting find in the cairns which occupy a plateau overlooking the cliffs lining the sea-shore at this point was a pot containing bones of fish and shell “together with plenty of fish-bones around”. There was also a fragment of a copper pin

or wire. It should also be noted that "large spoil-heaps or kitchen-middens composed of shells of all kinds and up to 40 feet or so across, strew the plateau by the side of the cairns ; in some instances the latter were found to be placed over them". The association of the cairns with kitchen-middens is not proved but one notes the occurrence of a quantity of fish-bones in one of the cairns.

- ✓ 20. Basot (*Stein, 1937, pp. 79-80*; in *Mockler, 1876* this site is called Darmanibhan)—Mockler noted the remains of 50-60 houses on the side of one hill with cairns on the hills in the vicinity. The number of cairns was estimated to be 2000-3000. There was also a furnace (12' long, 2' broad and 2.5' deep) on one of the adjacent hillocks. No excavation was done by Mockler. Stein also did not do any excavation but like Mockler he also noted a semi-circular enclosure at the foot of a hill, which contained inside "a line of much decayed dwellings raised on a clay-bank from 8 to 12 feet high".
- ✓ 21. Damba-koh (*Stein, 1937, pp. 73-78*; *Mockler, 1876*)—the work on Damba-koh was fairly detailed. The cairns are on the slopes of a range of hills cropping out of the coastal plain. They, according to Mockler, were square in shape, narrowing towards the top, and each one had a door with a stone lintel. The interior was somewhat dome-shaped with the walls narrowing to form part of the roof. Possibly the entire structure was plastered both inside and outside with mud. The average size is supposed to be about 10 ft. long and 4 ft. high. The largest one measured 14 ft. in length while the smallest ones were 4 ft. square only. Regarding the small ones Mockler's observation is that they were in some sort of planned relationship with the larger ones or they were on slopes difficult of access. He also noted that when these structures fell to ruin the stones formed a circle around a patch of clay. Out of the 4 existing structures he examined, he found "a small pot, fragments of a larger one, some reddish hair, and a piece of bone" in one but nothing in others.

Another part of Mockler's observation on Damba-koh is significant. Two hillocks (about 70-80 ft. high) in the vicinity were found covered with the ruins of densely built houses. "Most of them contained several rooms from fifteen to thirty feet square, besides smaller ones joining the main wall outside. They had doors, and small square loopholes for windows". Two of these houses were opened and Mockler had no doubt that they were the houses of people who buried their dead in the cairns. Apart from the fragments of pottery, some glazed with a green enamel, lying in the surface, he found in his excavated debris "many different-shaped vessels of pottery....., clay and stone beads of diverse shapes, stones for grinding...., stone for sharpening knives..., a shell ring, a piece of rope-pattern pottery, a lump of oxide of iron and a coin". The coin was determined to be a common type of Parthian silver coin.

Stein's report tallies substantially with that of Mockler but he does not mention the type having a dome-shaped interior and a door with stone lintel. Stein mentions about 2000 cairns. He also noted debris of dwelling houses of uncut stone. A level space, about 80 ft. long, in the saddle between two hillocks was found occupied by a double row of small rooms built back to back. Stein like Mockler had no doubt that these dwelling structures and the cairns were contemporary and related.

Stein opened 42 cairns and few dwelling houses. The nature of the finds was the

same in both groups. The bones were found unburnt. The vessels inside the cairns had in some cases food-stuff the nature of which is not specified. The vessels belong to the following main types: short-necked, narrow-mouthed, footed jar; open-mouthed, short-necked, ovoid, round-bottomed jar, painted with geometric designs (circular bands with a chain of small triangles) at the shoulder and with four perforated lugs around the body; crudely made beaker with a spout, but in one case with perforated lugs (not a spout); ovoid jug with a loop-handle and a spout; short-necked, open-mouthed, spouted jar with a loop-handle across the mouth, on one side of which is a pair of animals, moulded in the round and standing on their hindlegs; and small, footed platter (*Stein, 1937, Plate III*). A number of green-glazed potsherds were found both inside and outside the cairns. The other burial-deposits included steatite and pottery spinning whorls, a stone vase, many stone beads and what are called "perforated hones". The metal objects were the following: a footed bronze platter, "very thin iron vessels" (number and shape unspecified) and 2 iron javelin heads(?).

There was also the discovery of a Parthian copper coin (of Sinatruces, 77-70 B.C.) from within one of the cairns. The interior of the dwelling structures revealed the following groups of objects: roughly oblong grinding querns, hones and other stone objects of uncertain use, a decorated spindle whorl, beads of terracotta, glass and carnelian, fragments of glazed and painted pottery (the painted motifs being 'Greek' scrolls, zig-zag bands, vandykes, triglyphs etc), an iron ring and a thin silver ring. Mockler reported the remains of a furnace nearby but Stein does not mention it.

22. Ruhgam (*Lamberg-Karlovsky and Humphries, 1968, fig. 3, no. 22; Stein, 1937, p. 80*)—it is not mentioned as a cairn site.
23. Tiz (*Stein, 1937, p. 89*)—this site is listed as a cairn site by Lamberg-Karlovsky and Humphries (1968, fig. 3) but Stein does not seem to refer to any such burial at the site. He refers only to some Muslim graves.
24. Zehlamban valley (*Stein, 1937, p. 116*)—12 cairns opened; small bone fragments and pottery—pottery of porous clay covered with whitish slip; 5 complete hand-made vessels; a bronze finger ring and small stone beads. Lamberg-Karlovsky and Humphries seem to refer to this site as 'near Khurab'.
25. Murtan (*Stein, 1937, p. 116*)—mere report.
26. Baghsat (*Stein, 1937, p. 116*)—mere report.
27. Shahigan (*Stein, 1937, p. 116*)—mere report.
28. Kampsatar (*Stein, 1937, p. 116*)—mere report.
29. Damban (near Fanuch)—(*Stein, 1937, pp. 101-102*)—more than 120 cairns; 22 opened—pottery in close agreement with that found at Damba-koh—a saucer found filled with the remains of food-stuff including bones, apparently of bird. Among other objects one notes a glass stylus, metal (silver?) ornaments of twisted wire, portion of a folded silver plaque which might have belonged to a buckle and 2 perforated small scoop-like objects of shell.
30. Rampk (*Stein, 1937, p. 102*)—mere report.
31. Birinti (*Stein, 1937, p. 186*)—mere report.
32. Damel (*Stein, 1937, pp. 174-175*)—2 cairns opened; only bone fragments.
33. Darra-shor (*Stein, 1937, p. 175*)—numerous bone fragments; a semi-fossilized date in a small jar.

34. Hajjiabad (*Stein, 1937, p. 227*)—only 5 cairns examined—the shape is quadrangular, each divided by a thin middle wall into two narrow recesses.
35. Tump-i-Gabarha (*Stein, 1937, p. 171*)—mere report.
36. Chil-gabri (not mentioned in the text by Stein, 1936 but is clearly shown in section III of Map II of the same publication).
37. Dakhma-i-Gabar (*Stein 1937, p. 163*)—mere report.
38. Sar-i-Asiab (*Stein, 1937, p. 163*)—18 opened—bone pieces and pottery.
39. Chah-darut (*Stein, 1937, p. 163*)—mere report.
40. Zarand (*Stein, 1937, p. 163*)—a few opened ; report of handled and spouted jugs.
41. Rafshan (identical with Dakhma-i-Gabar)
42. Naksh-i-Rustam (*Stein, 1936, p. 196*)—cairns 10-15 ft. in diameter and 3-4 ft. high ; fragments of bone and pottery. A coin of Yazdagird III (632-651 A.D. found nearby.
43. Dogan (*Stein, 1936, p. 165*)—mere report.
44. Bishezard (*Stein, 1936, pp. 158-159*)—besides simple cairns, 2 groups of complex construction—in one group circular mounds built of rough slabs of sandstone or else show two concentric steps, an upper tier receding slightly from the lower one. The loose earth filling the centre contained fragments of human bone and coarse whitish pottery. A considerable number of stone and glass beads, pendants of blue frit (representing among other things a closed hand and a phallus), lugged pot, 4 iron lanceheads, 1 iron dagger in a bronze sheath with silver studs, 1 iron knife and a well-preserved coin of Yazdagird III are among the objects listed from this group,

The largest cairn of the second group had 3 tiers and measured 34 ft. in diameter. The two lower tiers had recesses. From one of the recesses came stone and glass beads, 2 small charms representing a frog and a lion couchant and 1 silver ring. The other recesses revealed frit and glass beads, fragments of blue glazed jar, brass rings etc. According to Stein the larger cairns could be family crypts.

45. Asmangird (*Stein, 1936, p. 136*)—the largest cairn here was 38 ft. in diameter and 8 ft. high and on being opened revealed a roughly built passage about 6 ft. long leading towards the centre from the southeast covered with 4 large slabs. Nothing significant discovered among the burial deposit.
46. Fattehabad (*Stein, 1936, p. 114*)—mere report.
47. Bushire (*Stein 1936, pp. 240-241*)—no specific mention of a cairn burial at this place but the possibility of its existence is suggested.

It may finally be noted that Lamberg-Karlovsky and Humphries (1968) excavated 3 cairns at Sar-i-Asiab and this has resulted in a clear understanding of the process of cairn construction at this site. The basic method seems first to lay one course of large, undressed stones as an outer retaining ring. This circle was then divided by an alignment of smaller stones running at right angles east-west across the cairn. The southern half could be divided by further alignments running north-south. The stones were piled up over this foundation without any specific order, though the upper half contained the

larger stones. No object of any specific significance was found in these excavations.

Fairservis' work at the site Q10 in the Quetta valley (*Fairservis, 1956, pp. 204-205, also Pl. 32*) proved to be rather negative in result. No artifacts were uncovered except plain sherds (only a few 'ring ware' pieces) and a few iron and bronze arrowheads were found in the gravels near the surface.

2. *Summary of the General Evidence on Cairn-burials*

Lamberg-Karlovsky and Humphries (1968), and K.S. Ramachandran (1974) have discussed the general evidence. Only a few points will be mentioned here. Besides, the list of the sites and the nature of work and finds in each of them should give an idea.

The concentration of sites is in the Dasht valley on the border of Iranian and Pakistani Makran. The general setting of the sites is in most cases a hill slope or crest, never far from a source of water. In some cases there are indications of stone and mud dwelling houses nearby. Stein and Mockler both commented on the contemporaneity between these houses and cairns at Damba-koh. The cairns may be divided into a few types. The first is what Mockler called square and Stein sub-rectangular. The size varied : at Damba-koh the average one in Stein's account measured 4-5 ft. high and 5-6 ft. square. The interior was filled with loose earth containing burial deposit and was roofed by stone slabs. Mockler specifically mentioned doors with stone lintels. Stein only referred to a small opening on the side. Mockler mentioned that in some cairns of this type the side walls narrowed towards the top to form a part of the roof. Stein did not mention this. At Hajjiabad in the Kirman area of Iran Lamberg-Karlovsky and Humphries noted "walls stepped inwards in a crude imitation of a corbelled vault". The second type is simply a circular pile of stones with a patch of earth in the centre containing burial deposit. The diameter varied but was usually 8-10 ft. The third type is in the form of a stepped structure. At Bishezard one cairn of this type measured 34 ft. in diameter and had 3 tiers rising to a total height of more than 14 ft. Two tiers had irregularly disposed recesses where the burial deposits were placed. The fourth type may be seen at Asmangird where a long passage leads to the centre of the circle. The third and fourth types seem to be peculiar to Fars area of Iran.

The burials were in all cases fractional burials. At Zangian the bones bore traces of burning. Remains of food-stuff were found in a few cairns. The primary pottery associated is a coarse whitish pottery, red or yellow in colour with a white slip. Stein noted its occurrence everywhere from Zhob to Fars. It is a wheelmade pottery. Another type (not uncommon) is a green-glazed ware. The distinctive shapes are : short-necked, ovoid, flat-bottomed or footed jars, which are very often loop-handled and spouted, and bear perforated lugs around the body for suspension (in one particular example of this type, on one side of the loop handle across the mouth there is a pair of animals moulded in the round and shown standing on their hindlegs) ; open jars with pedestals; beakers, sometimes with a spout and perforated lugs ; globular, close-mouthed pots with a spout and a loop-handle ; flat, ovoid, flask-shaped pots with a spout or what has been called a 'canteen-like vessel'. The decoration may take the form of mere incised wavy lines between sets of straight, horizontal lines. In many cases, however, there is a painted surface with various geometric designs among which the hanging spirals seem to be a distinctive one.

The main types of miscellaneous objects comprised stone, glass and frit beads, shell

and bone ornaments, wooden combs, steatite and pottery spindle-whorls, objects used as charms, 1 Parthian silver coin, 1 Parthian copper coin, Sassanian silver coin, fragments of glass, pendants etc. The metal objects were of copper-bronze, silver and iron. The copper-bronze objects consisted of a footed bronze platter from Damba-koh, two copper bracelets with snakehead pattern, 3 copper bracelets without any pattern, a copper lamp or censer, a copper ring with a bezel and fragments of a copper vessel from Jiwanri, fragments of copper wire or pin from Take-dap, fragments of cooper at Zangian, a bronze jar on a tripod, 3 bronze 'cat-bells' and three bronze rings (one of them having a bezel with a design in intaglio recalling Kushan-Gupta art) from Moghul Ghundai, a bronze finger ring from the Zehlamban valley and a bronze dagger sheath with silver studs from Bishezard. There were some small thin silver rings at Jiwanri, one silver ring at Moghul Ghundai, a portion of a folded silver plaque at Damban and a small silver ring at Bishezard.

The iron objects were the following ; a lump of oxide of iron, very thin iron vessels and 2 iron javelin heads from Damba-koh, some fragments of iron implements (unspecified) and an iron fish-hook from Jiwanri, fragments of an iron pot from Gatti, a broken large sword blade and a smaller one with a bronze fastening at the hilt from Zangian, 10 arrowheads and 1 spearhead from Moghul Ghundai, 4 triangular spearheads and a fragment of a horse-shoe from Bishezard. Finally, attention may be drawn to 2 small pieces of copper-bronze wire, a copper-bronze ring with a bezel, a fragmentary piece of iron, and beads of teracotta, bone and glass from Sar-i-Asiab. and the iron and bronze arrowheads and spearheads from Q 10 in the Quetta valley (*Fairervis, 1956, Pl. 32*) some of which closely resemble the Moghul Ghundai finds.

At this point one may refer to the Londo ware which was reported by Beatrice de Cardi (1951) in central to south Pakistani Baluchistan. It was never found directly associated with the cairns, as Ramachandran (1974) has rightly pointed out. Cardi's opinion on its Sialk VIB affinity does not concern us here—in passing it may be mentioned that there is no such affinity—but what needs emphasis is that the issue of the Londo ware date quite wrongly entered the discussion on the chronology of the cairn-burials. Cardi's opinion is worth citing : "There is, however, no resemblance between Londo Ware and the pottery from the cairns...it is suggested that the latter ware should be ascribed to a slightly later date than Londo Ware" (Cardi, 1951, p. 72).

3. Problem of Cairn-burial Chronology

The idea that the Baluchistan cairn-burials were prehistoric and associated with the problem of the beginning of iron in India was first put forward by D.H. Gordon (1950). First, he put emphasis on the continuous volute pattern of the cairn burial painted pottery and then drew attention to the occurrence of this design on two small sherds from Chiga-kabud in the Alishtar plateau of the central Zagros (Stein, 1940, pp. 289-290, Pl. XV, 14, 17) and also to some unpublished sherds with the same design from the site Bagh-limu in the Luristan region (Stein, 1940, p. 187). Chiga-kabud yielded two iron sickles with bent back tang, one of which was illustrated by Stein (1940, Pl. XV, 13). These belong to a type which also occurs in the VIB assemblage at Sialk (Ghirshman, 1939, vol. II, Pl. 57, 832a, tomb 15). Gordon's argument was as follows : Chiga-kabud had a link with Sialk VIB because it had an iron sickle with bent back tang ; Chiga-

kabud had also links with the Baluchistan cairn-burials because the continuous volute pattern of the cairn-burial pottery occurred on two small sherds at Chiga-kabud.

So, the Baluchistan cairn-burials were culturally linked with Sialk VIB.

This was Gordon's main argument. He tried to reinforce it by a few other analogies. Some objects from Moghul Ghundai—a copper bracelet of an adjustable type, a bronze jar on a tripod, small bells, thin copper rings and iron arrowheads—were supposed to have parallels among the finds from Sialk VIB. Among the arrowheads a three-flanged type also recalled a specimen from Nad-i-Ali in the Afghan Seistan and an analogy of the copper bracelet of the adjustable type was found also at Giyan. Attention was drawn to the occurrence of horse as an element of design on the Londo ware, which was supposed to have been derived from the horse friezes painted on many Sialk VIB pottery. In Gordon's argument the Londo ware was contemporary with the cairn-burials (even though they were never found associated) and so, if the Londo ware was of Sialk VIB inspiration the cairn-burials were similarly inspired too. In this context he also drew attention to the presence of two horse heads at Zangian.

Once the Sialk VIB association of the cairn-burials was 'established' the problem of dating them became comparatively easy. There were only two issues involved : how to date Sialk VIB and how much time-gap to allow for the influence to spread to Baluchistan. Gordon (1958) accepted a date of 1200-1000 B.C. for Sialk VIB and put the beginning of the Baluchistan cairn-burials around 900 B.C. He also gave the practice some time to spread from its beginning in the Makran area to Zhob-Loralai in the north-east and put the later group between 650 and 450 B.C.

The first criticism of this view of Gordon came from Leslie Alcock (1952). Apart from emphasizing the extremely tenuous and flimsy character of Gordon's argument for a Sialk association of the cairn burials, he suggested some positive historical parallels from a much closer context for some Moghul Ghundai objects. The Moghul Ghundai bronze jar with a tripod could be matched by the jar no. 207 in John Marshall's *Taxila* (Marshall, 1951, p. 584, Pl. 177). Two other bronze jars on tripod are illustrated from Taxila but typologically 207 comes closest to the Moghul Ghundai specimen. All the Taxila specimens are from the Parthian level of the city. The small bells are common enough in the cultural assemblage of Sirkap of the first century A.D. They occur in a third century B.C. context at the Bhir mound but it is in the first century A.D. Sirkap that they are in good number (Marshall, 1951, Pl. 176, nos. 344-349, p. 598). Iron arrowheads, copper bracelets of an adjustable type and thin copper rings which have been found at Moghul Ghundai and whose analogies were sought by Gordon in widely differing contexts of Sialk VIB, Nad-i-Ali and Giyan are not particularly distinctive types by themselves and thus of no comparative value but if one is keen on finding parallels one can easily find them at Taxila (Marshall, 1958, Pl. 177, 165). The Moghul Ghundai copper finger ring with a bezel, which shows a male with a high headdress, carrying a spear and a bow, and a female in long skirt suggested Kushan-Gupta workmanship to Stein. The design was never illustrated but the date seems to be clear enough : sometime between the 1st and 4th/5th centuries A.D. The same may be said about the small pot with Classical designs of festoons and medallions from Moghul Ghundai. In this context Alcock also hazarded a guess about the date of the Londo ware. He noted that the grog-backing of the Londo ware had a similarity with a later pottery around Quetta which was called by Stuart Piggott (1950) a Sassanian pottery. Alcock's comment was :

"Though the percentage of grog is lower and the shape of the particles differs from those in Londo ware, this Sassanian pottery may provide a clue for its dating".

B.R. Subrahmanyam (1964) followed Alcock in the sense that he also called the Moghul Ghundai assemblage early historical, his main emphasis being on the copperring (with figures) and the pot with Classical designs. Lamberg-Karlovsky and Humphries briefly reviewed the data in 1968. They also found no "convincing parallels to the Sialk B culture of the material contents found in the cairn-burials". On the other hand they emphasized the Taxila analogies of Moghul Ghundai objects, the find of a Parthian copper coin of Sinatruces (77-70 B.C.) at Damba-koh and the find of a Sassanian silver coin of Yazdagird III (632-651 A.D.) at Bishezard. The open pedestal bowls from Fanuch and Suntsar could be matched by the similar bowls from Taxila. For the canteen flask, a distinctive cairn-burial pot-form, they found an analogy in the Susa-Achaemenid village III and also drew attention to an unpublished find of this typical Parthian form from near Pasargadae. Their conclusion was that the evidence suggested a date in the "last two centuries B.C." but at the other end the cairn-burials could continue up to the 7th century A.D. Moreover, they drew attention to the existing Baluchi custom to build cairns to commemorate funerals or even as a part of marriage ceremony.

Ramachandran (1974) accepts Sialk analogy but points out the currently accepted late date of Sialk VIB (8th century B.C. ; cf. Dyson, 1965, p. 208). He also draws attention to certain similarities between the pottery of Baba Jan A in Luristan, dated 6th century B.C. Primarily on this basis Ramachandran dates the beginning of the cairn-burials to 6th-5th centuries B.C. but he is prepared to put the terminal point about 7th century A.D. Ramachandran's Sialk analogy is based on his statement : "...jugs with flattened spouts from Zangian and Jiwanri are found in Sialk B". Flattened spouts are not helpful for valid comparisons particularly when the vessels concerned are thoroughly dissimilar in every other way. A close look at the Sialk VIB vessels published by Ghirshman should settle this point. Our study of the Sialk material of this phase makes us feel convinced that this has no analogy, even a remote one, in any Indian material. Sialk VIB assemblage is a very distinctive one and it would be very illogical to isolate any insignificant item out of context and compare it with something in a different assemblage. Ramachandran's Baba Jan A analogies also fail to convince because the shapes and designs he cites continue in a later period.

The evidence of a historical date for the cairn-burials seems to be clear enough. The indisputable pieces of internal evidence are : a silver coin found at Damba-koh by Mockler, which was said to be a common Parthian type ; a copper coin of the Parthian Sinatruces (77-70 B.C.) found at Damba-koh by Stein ; a silver coin of Yazdagird III (Sassanian, 632-651 A.D.) found at Bishezard in Fars ; the pot with Classical designs and the copper ring with a design in intaglio from Moghul Ghundai. As far as the last item is concerned we would put or trust in Stein's assessment of their dates than in any different interpretation (cf. Ramachandran, 1974, p. 87). The Taxila analogies of some Moghul Ghundai finds like the bronze jar on a tripod, etc. may not be particularly distinctive by themselves but in the light of the above-mentioned internal evidence they are far more convincing than any tenuous and arbitrary Sialk parallel. In fact, the Taxila analogies may be pushed a little further. The flat, flask-shaped, lugged vessel which Mockler first illustrated from Damba-koh has an exact parallel in a find from Parthian Sirkap (Marshall, 1951, p. 412, pl. 122, no. 44). Those who are reluctant to admit any early historic

occupation in Baluchistan may be reminded that Stein (1929, pp. 64-70) discovered a Buddhist Stupa site at Tor Dherai in Zhob-Loralai and that the Sampur mound, Mastung, Kalat, revealed a silver cup (*Hargreaves, 1925, Pl. IV*) which can be matched in every detail at Taxila (*Marshall, 1951, Pl. 188, nos. 5a, 5b, p. 612*).

It should also be mentioned that Stein subsequently found at Sampur the coarse red ware with a white slip which is in fact a characteristic cairn-burial pottery. He also commented on a "close similarity in shapes" between the pottery excavated by Hargreaves at this indisputably early historic site of Sampur and the pottery found by him at sites like Moghul Ghundai, Zangian and Jiwanri (*Stein, 1931, pp. 188-189*). Finally, one may refer to the fact that the Londo ware has been found in a Partho-Sassanian context at Tepe Yahya (*Iran, 8, 1970, p. 197*) and that the thermoluminescent date for the Ghul ware, a variant of the Londo ware, ranges between 400 and 1000 A.D. (*Possehl, 1975, p. 37*).

The present discussion has tried to make clear the completely untenable mode of Gordon's argument to establish a Sialk analogy for the cairn-burials. A number of subsequent scholars accepted his argument without any question. Banerjee (1965), for example, based on an early dating of these cairn-burials his theory of the origin of south Indian megaliths. The only reason one can think of this acceptance of Gordon's reasoning is these scholars' general eagerness to explain anything in the Indian northwest in terms of a migration from the west.

F.R. Allchin (n.d.) points out and we fully agree with him that there has been no serious fieldwork on these cairns since the work of Stein and it is possible that not all the cairns are as late as we have suggested. Our concern, however, has been with the present available data which do not imply any earlier date.

IV. Swat Valley

The geographical area involved is north-northeast of Peshawar and marked by the Indus on the east, the Kunar-Chitral on the west, Chitral on the north and the Peshawar plain on the south. The first occurrence of iron in this area is associated with the Gandhara grave culture.

1. SITES

In 1967 A.H. Dani (1967, Figure 1) mapped the following sites: Inayat Qila, Balambat, Timargarha, Ziarat, Charpat, Chakdara, Thana, Barikot, Mingora, Gorband, Tarbela, Panjpir and Jamalgarhi. These sites were located by the Peshawar University team under Dani, which also excavated the grave sites of Timargarha and Thana and the settlement site of Balambat. The total number of graves excavated was 133-121 at Timargarha and 12 at Thana. Balambat was found to have an Achaemenid level, dated 6th-4th centuries B.C. This level yielded some iron objects but in the present context only the pre-Achaemenid iron objects from Balambat will be taken into consideration.

In 1972 Chiara Silvi Antonini and G. Stacul (*Antonini-Stacul, 1972, Vol. II, map of Swat*) mapped the sites located by the Italian Archaeological Mission in Pakistan. The sites are Noghurmuri, Tamunak, Ushoram, Rashnel, Kherai, the site shown near Thutano Bundai, Aligrama, Charbag, Tilgram, Katehai, Butkara, the site shown between

Gogdara and Ghaligai, Loebanr (2 sites), Kukarai, Gumbatuna, Gatkot, Kanjarkote, Sogalai, Pulanr, Lalbatai and Tarike. This map shows a concentration of sites in the middle reaches of the Swat. The graves excavated by the Italian Mission at different sites are 48 at Butkara, 183 at Loebanr, 243 at Katelai, 12 (?) at Kherai, 4 at Lalbatai, 5 at Tarike and 1 each at Sogalai, Pulanr and Noghurmuri (*Antonini-Stacul*, 1972; *Stacul*, 1966, pp. 261-274; *Stacul*, 1967, 220-232; *Stacul*, 1969; pp. 92-99; *Stacul*, 1970, pp. 87-91). Aligrama (*East and West*, 1974, pp. 478-479) seems to be the only settlement site excavated by the Italian Mission. Mention should also be made of the grave site Zarif Koruna near Warsak in Peshawar district (*Stacul*, 1974, p. 241). There may be a few more reported sites like Pehur listed by Dani (1967, p. 232), and Bala Hissar and Bakamak in Chitral listed by Stacul (1969, pp. 92-99).

2. IRON OBJECTS

Grave Sites

Timargarha (*Dani*, 1967, pp. 194-195) : (1) grave no. 199—1 midrib-less spearhead, length 5 ft. 3 ins. (*Dani*, 1967, Pl. L_a) ; (2) grave no. 192—2 disc-headed nails, broken ; (3) grave no. 112—1 disc-headed nail ; (4) grave no. 149—1 spoon, the handle terminates in two rings, one on each side ; (5) grave no. 142—1 cheek-bar of horse's harness. "rectangular sectioned straight bar with three elliptical holes made at equal distance from each other. The ends are provided with one knob each". Length 6 ft 3 ins. (*Dani*, 1967, Pls. L_a, nos. 6, 7, 8, L_b, 2a).

Loebanr : (1) tomb no. 41 (*Antonini-Stacul*, 1972, p. 101)—fragments of iron ; (2) tomb no. 97 (*Antonini-Stacul*, 1972, p. 160)—spearhead (1), 1 pin ; (3) tomb no. 136 (*Antonini-Stacul*, 1972, p. 202)—fragment of a pin ; (4) tomb no. 140 (*Antonini-Stacul*, 1972, p. 208)—fragment of a pin ; (5) tomb no. 153 (*Antonini-Stacul*, 1972, p. 219)—fragment of a pin.

Katelai : (1) tomb no. 14 (*Antonini-Stacul*, 1972, p. 267)—1 spearhead ; (2) tomb no. 16 (*Antonini-Stacul*, 1972, p. 271)—fragments ; (3) tomb no. 41 (*Antonini-Stacul*, 1972, p. 289)—fragments ; (4) tomb no. 81 (*Antonini-Stacul*, 1972, p. 292)—fragment of a pin ; (5) tomb no. 110 (*Antonini-Stacul*, 1972, p. 110)—fragments of a pin ; (6) tomb no. 126 (*Antonini-Stacul*, 1972, p. 123)—fragment ; (7) tomb no. 144 (*Antonini-Stacul*, 1972, p. 337)—1 pin ; (8) tomb no. 158 (*Antonini-Stacul*, 1972, p. 348)—fragment of an arrowhead (?) and fragment of a pin ; (9) tomb no. 174 (*Antonini-Stacul*, 1972, p. 363)—fragment of a pin ; (10) tomb no. 175 (*Antonini-Stacul*, 1972, p. 364)—2 spearheads ; (11) tomb no. 178 (*Antonini-Stacul*, 1972, p. 367)—1 spearhead and fragments of a pin ; (12) tomb no. 189 (*Antonini-Stacul*, 1972, p. 376)—1 axe and pieces of 2 spearheads ; (13) tomb no. 212 (*Antonini-Stacul*, 1972, p. 397)—pieces of a spearhead and 2 axes.

Butkara II (Butkara I is a Buddhist site) : (1) tomb no. 10 (*Antonini-Stacul*, 1972, p. 444)—fragments of a point ; (2) tomb no. 14 (*Antonini-Stacul*, 1972, p. 449)—fragment ; (3) tomb no. 17 (*Antonini-Stacul*, 1972, p. 455)—fragments ; (4) tomb no. 21 (*Antonini-Stacul*, 1972, p. 460)—fragments ; (5) tomb no. 30 (*Antonini-Stacul*, 1972, p. 471)—1 spear (both shaft and head) ; (6) tomb no. 33 (*Antonini-Stacul*, 1972, p. 473—fragment) of a spear ; (7) tomb no. 34 (*Antonini-Stacul*, 1972, p. 475)—fragments ; (8) tomb no. 36 (*Antonini-Stacul*, 1972, p. 478)—fragments ; (9) tomb no. 42 (*Antonini-Stacul*,

1972, p 487)—fragments.

Pulcnr : grave no. 1—3 iron objects : 1 leaf-shaped spearhead, 1 javelin head (?). 1 pin (*Stacul*, 1967, p 228).

Noghurmuri : grave no. 1—1 two-barbed, tanged arrowhead (*Stacul*, 1969, p 95)

Settlement Sites

Balambat (*Dani*, 1967, p 273)—Period III (of Dani) : 4 specimens ; “one blade of a knife and 3 other fragments probably belonging to some nails”.

Aligrama (*Stacul, unpublished*)—Period VI (of Stacul) : fragments.

The number of iron-bearing graves in the major cemeteries like Timargarha, Loebanr, Katelai and Butkara II in the context of their total number of excavated graves is as follows :

<i>Site</i>	<i>Excavated Graves</i>	<i>Iron-bearing Graves</i>
Timargarha	121	5
Loebanr	183	5
Katelai	243	13
Butkara II	48	9

3. CHRONOLOGY

None of the radiocarbon dates available for the Gandhara grave culture comes direct from an iron-bearing grave. One has to depend on the schemes of periodisation adopted by Dani (1967) and Stacul (1969) and then find out the period (or periods) to which the iron-bearing graves have been assigned.

Both Dani and Stacul propose a three-fold periodisation. Dani's chronological scheme is : Period I—16th-13 centuries B.C. ; Period II—12th-10th centuries B.C. ; Period III—9th-6th centuries B.C. (*Dani*, 1967 p 48). Iron belongs to Period III.

Stacul calls these periods “archaic, middle and late”, which have been related by him to the general prehistoric sequence of the area worked out on the basis of his excavation in the Ghaligai cave (*Stacul*, 1969). The three periods of the grave sequence cover the periods V, VI and VII of this general sequence. In his 1969 publication Stacul suggested the following chronological scheme : Period V or archaic phase of the graves—2nd half of the second millennium B.C. (beginning) ; Period VI—6th-5th centuries B.C. (middle phase of the graveyards) ; Period VII (late phase of the graveyards)—500-400 B.C. (*Stacul*, 1969). In a recent publication Stacul (1974) puts the date of the period VII in the 7th-6th centuries B.C. In a personal communication to D.P. Agrawal (dated Trieste, 18-7-1975) he suggests that Period V had a long duration, “from c. 1400 to 900-800 B.C.”.

In his publications Stacul has always emphasized that iron occurs for the first time only in Period VII. Even in his 1974 publication (*Stacul*, 1974) he does not mention iron before this period. If one goes by the published opinion the beginning of iron in the Gandhara graves should be put, according to him, in the 7th-6th centuries B.C.

In 1974 D.P. Agrawal and Sheela Kusumgar (1974, p 69) reported “meagre iron” in Period V. On being pointed out (in a personal communication by the present author)

that this was not in accord with the published opinion of Stacul, they cited a personal communication from Stacul (dated Monfalcone, 7-9-1971) which contained the following statement : "The first iron in Swat is to be referred to the 5th period in the general sequence. It is attested by the presence of a fragment of iron (pin?) in the grave no 126 of Katelai. But apart from this exception, on the ground of the actually available data, iron objects recur in the Swat valley only in the 7th period". In his personal communication to Agrawal in 1975 (dated Trieste 18-7-1975) Stacul further mentions that a few iron fragments have been found in a Period VI context at Aligrama.

It is difficult to accept Agrawal-Kusumgar dating of 1000 B.C. for the beginning of iron in Swat (*Agrawal-Kusumgar, 1974, p 69*) on the basis of these personal communications. First, the find is so small that it is of indeterminate shape and may very well be a later intrusion. Secondly, Stacul himself admits that Period V continued up to 900-800 B.C. How does one know that this piece of iron does not date from this terminal period but from an earlier one ? Thirdly, it may not be logical to postulate the beginning of iron in Swat on the basis of such a negligible find. The Aligrama fragments in a Period VI context should be more dependable finds but according to Stacul Period VI can be dated only after 800 B.C. In the present stage of knowledge we do not think there is any evidence to be more positive about the date of the beginning of iron in Swat except to say that it may be placed somewhere in the first half of the first millennium B.C.

4. Cultural Correlations

A review of all the suggested correlations of the Gandhara grave culture is beyond the scope of the present paper but a notice may be taken of the suggested central Asiatic and north Iranian Iron Age analogies. The most significant item in a central Asiatic analogy of this phase is the iron cheek-piece in grave no. 142 at Timargarha, which as Karl Jettmar has demonstrated, fits in with the central Asiatic types current in the 10th-6th centuries B.C. (*Jettmar, 1967*). Jettmar's tentative dating of the Timargarha specimen is 7th-6th centuries B.C. (*Jettmar, 1967, p 207*). The most striking Iron Age north Iranian analogy is perhaps the triple pot on a single stem from Butkara II (*Antonini, 1963, Figure 8*), which is exactly matched at Marlik (*Negahban, 1963, Figure 9*) and Kaluraz (unpublished)³. But as far as one is aware there are only these two specimens in northern Iran. Besides, the over-all cultural assemblage of these Iranian sites is very different from the assemblage of the Gandhara grave culture. There is a general resemblance between a Gandharan ceramic form (*cf. Dani, 1967, Figure 37, no. 5*) and Hasanlu "button-based" pottery type (for comparative illustrations, *Dani, 1967, Figure 61*) but the over-all cultural content again differs widely. A central Asiatic contact of the Gandhara grave culture is likely to be closer than any north Iranian one.

V. Summary

The present paper aimed at making a systematic evaluation of the data and problems

3. Marlik, Kaluraz and Hasanlu materials are in the Tehran Museum where I could study them due to the courtesy of the Iranian Directorate of Archaeology. I owe a special word of thanks to Mrs Parveen Moghadam for drawing my attention to the Kaluraz material.

related to the beginning of iron in the northwestern part of India. Iron ore suitable for pre-industrial smelting occurs in this region. The evidence of a prehistoric use of iron comes from only two areas : the Kachhi plain in Baluchistan and the Swat valley. Pirak is the only reported and excavated site of this type in the Kachhi plain. Iron begins here around 800 B.C. (radiocarbon). There is no evidence to put the beginning of iron in Swat around 1000 B.C., though a somewhat later date seems to be probable enough. There is also no evidence to relate these two early northwestern centres of iron to anything else in inner India. The existing dates do not support any data earlier than the first century B.C. for the Baluchistan cairn-burials.

Acknowledgement

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Post-script : After this paper was finalised in 1975 I could consult William Fitz's unpublished B.A. Hons. (Anthropology) thesis in the Peabody Museum library, Harvard : *A Report on recently discovered cairns, cave graves, rock art and a possible dakmen from southeastern Iran.* Although the earliest date-range suggested by Fitz is about 6th century B.C., there is nothing yet which would change our dating of the Pakistani cairn-burials.

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M.D.N. SAHI

AHAR IS a well known and very important protohistoric site. The site was excavated in 1955-56, and then again in 1961-62. A detailed report of the latter excavation was published in 1969 (Sankalia, 1969). In the present paper an attempt has been made to re-examine the data concerning the iron objects, in their stratigraphical and chronological context and highlight some very significant evidence which has hitherto remained ignored or unnoticed.

The entire deposit at the site has been classified into two major Periods I and II with 3 sub-periods in each. 'There is a long chronological gap between period I and II which, however, is not attested by the stratigraphical evidence'.

As far as iron objects are concerned it has been mentioned that 'Period II at Ahar is marked by the introduction of iron and early historic assemblage. Period IIa, was associated with the NBP and seals with 3rd century B.C.'

No iron objects were reported from the previous excavations at the site. Subsequent excavations of 1961-62 have yielded as many as 79 objects of iron. Out of these thirty six were iron slags. Of the remaining 43, seventeen were corroded, fragmentary or otherwise unidentifiable. In all 25 iron objects are illustrated and therefore we are on surer grounds about the stratigraphic position of these objects. We do not know exactly the stratigraphical position of the 36 slags and 17 unidentifiable or corroded objects. However, the stratigraphical position of the illustrated objects is quite significant. As indicated in the adjoining chart, out of 25 iron objects, as many as 10 were recovered from the layers which have been classified as belonging to period Ic and two objects were from those layers which have been classified as belonging to Phase Ib of the protohistoric Ahar.

On the basis of this stratigraphical position of the iron objects, it becomes difficult to agree with the authors of the report of Ahar excavations, that 'iron made its appearance along with NBP at the site'. If it is insisted that the correlation of the layers of different trenches as given in the chart is reliable and faultless, then to us it would suggest that Ahar is a site which provides a definite and datable evidence of the earliest iron in India, known so far. However, it will have to be admitted that iron appears in only the upper deposits of period Ib.

As far as the chronological aspect of this problem is concerned, it may be noted that two carbon samples TF 31 and 32 have helped in dating period Ic at Ahar between 1270 B.C. and 1550 B.C. Thus, as indicated by the position of iron objects in the deposits the introduction of iron at the site may well go upto the beginning of the 16th century B.C., if not earlier. In absence of any available carbon date from the deposits of Period Ib this conclusion can only be *tentative and speculative*. However, the most significant evidence comes from the layer 5 of Trench X which represents the upper-most deposit of period Ic. From this deposit were obtained dish-on-stand and the Lustrous Red Ware, besides the painted Black-and-Red Ware. The charcoal sample for TF 31 was also collected from this layer and it is this very deposit which has yielded two iron arrowheads, measuring 9.7 cms and 10.9 cms respectively. It may also be recalled here that almost similar evidence has come from Eran also. It also confirms the occurrence of iron in a deposit datable to the beginning of thirteenth century B.C.

Next question which strikes us in this connection is, whether we can call Ahar Ib (upper levels) and Ic as Early Iron Age cultural periods or not. Before considering the actual evidence on this point it may not be out of place to mention here that local smelting of the metal is a necessary ingredient for a particular culture to be called as an Iron Age Culture. On the basis of imported objects of iron a culture should not be called an Iron Age Culture.

To answer the question posed above we have very significant evidence from Ahar. Plentiful iron slags were found in regular and scientific excavation from layers 2 and 3 of Trenches H and I and the excavation has assigned these deposits to Period Ib. It would not be out of place to reproduce their observation as such. 'Now it may not be a pure accident that we find evidence at these levels (layers 2 and 3 of Trenches H and I) of copper and iron smelting in the form of slags. This occurs plentifully in layer 2, which is loose ashy grey, while layer 3 is otherwise compact and brownish in colour.'

Then there are valid reasons to conclude that Ahar Ib (upper deposits) and Ic represent the earliest stage of one of the Iron Age cultures in India. Second conclusion, which should remain tentative till a definite evidence corroborated by carbon date comes forth, would be, that the date of the beginning of iron smelting in India may well be placed as early as the sixteenth century B.C. Many other significant implications, can further be derived from this study, but we are afraid, they may not be relevant here. It may further be added that, whatever may be the date of earlier beginning, by about the early decade of thirteenth century B.C. 'iron smelting, was definitely known in India on a bigger scale.

Appendix I

Trench and Layer Wise Distribution of Iron

Total Iron Objects—79

1. Slags.....36 Stratigraphic
 2. Unidentifiable position is
 and corroded—17 not given.

S. No.	Objects.	Acc. No.	Size length in cms.	Illustration No. of Fig. 123	Trench Layer	Assigned culture	Assigned Date
1.	Arrowhead	1926	7.1	5	X (1)	IIa	AD
2.	Peg	1929	9.7	20	X (1)		1800
3.	Arrowhead	1824	2.8	6	X (2)		
4.	Arrowhead	1826	6.8	7	X 2		Kushana
5.	Chisel	2130	9.5	17	X 2		IIb
6.	Nail	1649	3.8	22	X 2		
7.	Arrowhead	1852a	10.2	8	X 3		Indo-Greek
8.	Arrowhead	1852b	8.4	9	X 3		
9.	Arrowhead	2183	10.2	10	X 3		IIb
10.	Axe/Adze	1853	6.7	18	X 3		
11.	Arrowhead	2481	9.7	11	X 4		Cent. B.C.
12.	Arrowhead	2483	6.6	13	X 4		IIa
13.	Ring	2479	2.8	25	X 4		
14.	Arrowhead	2482	9.7	12	X *5		*TF 31—1283 B.C. (1270)
15.	Arrowhead	2498	10.9	14	X *5	Ic	(—)
16.	Arrowhead	1397	1.4	2	C 2		
17.	Arrowhead	1260	8.4	4	C 2	Ic	1270 B.C.
18.	Nail	1549	5.1	23	C 3	Ic
19.	Arrowhead	127	6.6	1	D 1		
20.	Chisel	126	7.6	15	D 1	Ic	1550 B.C.
21.	Peg	450	7.9	15	D 1		
22.	Socket	214	9.5	19	D 2	Ic	
23.	Chisel	249	8.6	16	L 1	Ic	
24.	Arrowhead	619	10.2	3	L 2	Ib	
25.	Ring	879	7.1	14	E 3	Ib	
26.	Slags	—	—	—	H & 1 (2)(2)	Ib	

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et al.

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FIVE

RADIOCARBON CHRONOLOGY



Radiocarbon Chronology of Indian Protohistoric Cultures

27

D.P. AGRAWAL & SHEELA KUSUMGAR

IN INDIA we face a peculiar problem in dating even early history. Though the Indus Civilization was literate and urbanized, yet in the absence of an acceptable decipherment of the script, we can have neither a historical account of the culture nor a proper dating. The other Chalcolithic Cultures do not even have any evidence of the use of a script. As a result, we can use our historical records only from about the fifth century B.C. In the absence of a better term, these Chalcolithic cultures—including the Harappa Culture—are included in the 'Protohistoric Period' (See, however, Ghosh, this volume).

These protohistoric cultures have been loosely dated on the basis of their archaeological affinities with West Asia. But mainly the chronologies are now based on radiocarbon dates. In the last 15 Years of ^{14}C dating in India about 1000 ^{14}C determinations are now available for Indian archaeology. We will, however, discuss here only the chronology of the copper and iron using early cultures.

We will see below how a disparate evolution in different parts of the sub-continent is brought out by a chronological analysis. The ecological factors also become important in understanding the cultural patterns, but we will only briefly touch upon them in our discussions.

Calibration of ^{14}C Dates

In recent years much controversy has been generated on the issue of $^{14}\text{C}/^{12}\text{C}$ variations in the past and their consequent effect on ^{14}C dates. We have also been involved in this exercise (Agrawal & Kusumgar 1974a, p. 70; Kusumgar & Agrawal, 1975). We still feel—on the basis of the reasons briefly explained below—that to avoid confusion on ^{14}C dates they should not be corrected at this stage but should be given as such clearly indicating the half-life employed.

The following problems have not been satisfactorily resolved yet. There is evidence that radial diffusion of plant nutrients can cause a mix-up of younger and older carbon in tree-rings (Agrawal & Kusumgar, 1974a, p. 70). The $^{14}\text{C}/^{12}\text{C}$ variation evidence is only based on trees like sequoia and bristlecone pine which lived for 4000-5000 years at an altitude of 3000 m or above. Both the altitude and the ages of the trees are totally

atypical from the normal archaeological samples. Well dated archaeological samples upto the II millennium B.C. do not show any appreciable difference from the ^{14}C dates based on 5730 half-life (*Berger, 1970, p. 20 : Kusumgar & Agrawal, 1975*). As the main period dealt with in this essay falls in the II-I millennia B.C. and because of the abovementioned uncertainties, we prefer to use uncorrected dates based on 5730 half-life. For a more detailed discussion on calibration one can refer to Agrawal & Kusumgar (1974a, p. 70). Olsson (1970), Rafter & Grant Taylor (1972) and Ralph, Michael & Han (1973, p. 1).

In the following pages we will discuss the chronology of the Indus Civilization, Chalcolithic Cultures and the Iron Age Cultures—in that order.

Indus Civilization : (*Table I*)

The Harappa Culture or the Indus Civilization was spread over a wide area from Sutkagendor on the Makran Coast to Alamgirpur in Western U.P. and from Panjab to Bhagatrav in South Gujarat. The distribution of the culture is confined to a semi-arid tract, watered by the Indus River. The culture is distinguished by planned cities, underground drains, grid-form of roads, a script, black-on-red ware and long chert blades. The famous city sites of this culture are Mohenjo-Daro and Harappa in Pakistan and Kalibangan and Lothal in India. The Harappa culture seems to emerge abruptly on the scene. There are a number of village and semi-urban cultures that flourished in Baluchistan, Sind, Panjab and Haryana which perhaps contributed significantly to the genesis of the Harappa Culture. These antecedent cultures go by various names : Pre-Harappan, Sothi, Non-Harappan, Early Harappan etc. We need not go into the controversies and detailed dating of such sites here. These problems have been discussed in detail elsewhere (*Agrawal and Kusumgar, 1974b*) and not much fresh data have come up since then. Amri, Balakot, Damb Sadaat, Kalibangan I, Kot Diji I, Mundigak, Niaibuthi, Nindowari Damb, Hathala and Gumla have been termed here Pre-Harappan Cultures (*Table I*). These so-called Pre-Harappan cultures start around 3000 B.C. and some even continue into the II millennium B.C. —

There are now several ^{14}C dated Harappan sites (*Table I*) : Bānawali, Bāra, Kalibangan II, Lōthal, Rojdi, Mitathal and Sūrkotada all from India. Bāra and Mitathal can, however, be included under Sothi culture which started before the Harappa Culture and continued even later. Unfortunately, in the absence of published reports one cannot define their exact cultural affiliation. From Pakistan, Kot Diji, Mohenjo-Daro, Ghalighai are the ^{14}C dated Harappan sites.

Both culturally and chronologically, the beginnings of the Harappa Culture are difficult to define. The classical sites of Mohenjo-Daro and Harappa have not been adequately ^{14}C dated so far. One will therefore have to date the beginning of the Harappa Culture with the help of the ^{14}C dates of the immediately preceding cultures of Damb Sadaat II and Kot Diji. At both these sites the Harappa Culture follows these Pre-Harappan Cultures. At Damb Sadaat II, L-180 C, 180 E and P-523 fall around 2200 B.C. and by adding one standard deviation to this date one can place the end of Damb Sadaat II earliest to c. 2300—2400 B.C. The latest Kot Diji I levels are dated by P-195, 1100 ± 140 B.C. By adding one standard deviation we get 2240 B.C. Thus one can extrapolate the beginning of the Harappa culture to c. 2300—2400 B.C. Of course, for a more reliable dating one has to wait for samples from the earliest levels of Mohenjo-Daro

and Harappa.

For the end of the Harappa Culture in the *nuclear regions*, there are seven dates from the upper levels of Mohenjo-Daro. From the upper levels of the recent excavations by Dales six dates have been compounded by us to yield a mean date of c. 2000 B.C. Thus in the *nuclear regions* the Harappan timespread can be ascribed to c. 2300-2400 B.C. to 2000 B.C.

Perhaps one can describe the peripheral Harappa Culture as that which spread into Rajasthan and Gujarat. A large number of ^{14}C dates are now available from Kalibangan, Lothal, Srinathgarh (Rojdi), Surkotada etc. From the earliest Harappan levels of Mound-II of Kalibangan two dates are available: TF-607, 2090 ± 125 B.C. and TF-608, 2085 ± 110 B.C. Adding one standard deviation error to them one gets c. 2200 B.C. for the beginning of the Harappa culture at Kalibangan. For phase I of Lothal we have TF-836, 2080 ± 135 B.C. and by adding one standard deviation, one gets c. 2200 B.C. Of course, the culture continued upto 1700 B.C. or so, (*Table 1*). Banawali (Haryana) has some late dates (PRL-204, -207), which even extend upto 1300-1400 B.C. Unless we have more dates, one does not know if one is dealing with a late Harappan survival here or simply some contamination. Surkotada has also provided several dates. Except PRL-85, all the other eight dates from Surkotada fall within c. 2100-1650 B.C.

Thus the timespread for the nuclear Harappa is c. 2300-2000 B.C. and for the peripheral regions c. 2200-1700 B.C. with a possibility of later extension.

Chalcolithic Cultures (*Table 2*)

The chalcolithic cultures are characterised by the use of copper and stone tools (*Sankalia, 1974, p. 279*). As it used both stone and copper Harappa Culture can also be included in this category, though customarily it is treated separately. Below we will discuss the chronology of the Kayatha, the Banas, the Malwa, the Jorwe, the Ochre Colour Pottery (OCP), the Black-and-Red ware (BRW) and the prabhas cultures.

Ahar, near Udaipur, is a Banas Culture site. The Banas Culture is mainly marked by a painted BRW tradition, though a variety of other wares including the Black--on-red ware also occur. Typologically, similarities have been found between the Rangpur Pd III and Malwa Ware on the one hand and the Banas Culture on the other.

For Ahar, one has nine ^{14}C dates. Since V-54, -55, -56, -57, -58 all come from Pd Ia of Ahar they can be compounded to get a mean date of c. 1995 ± 45 B.C. viz. c. 2000 B.C. Thus the Banasian Culture at Ahar can be defined by a bracket of c. 2000-1400 B.C. Bagor is a microlithic site in Rajasthan but in its upper levels metal also occurs in the form of thin triangular arrowheads. TF-1005 & -1006 and TF-1009 place this phase between c. 2700-2100 B.C. As these cultures are part contemporary, it is worth examining whether these cultures had hostile or friendly contacts with the Harappa Culture. Jodhpura, an OCP Culture site, has been dated for the first time in Rajasthan. Only two dates are available : PRL-278, 2230 ± 180 and PRL-275, 2530 ± 160 B.C. These dates are indicative of a very early beginning of the OCP in this region. Was it a Pre-Harappan Culture?

The spread of the Kayatha Culture is confined to M.P. and it is so known after the name of the site, where it was first discovered. The main ceramic is a thin sturdy ware with purple paintings on a black background. Incised and *applique* decorations are very

characteristic. Use of huts, copper and stone blades is attested to. There are eighteen C^{14} dates available for this site. Only the second excavation gave an internally consistent set of dates. Only TF- 680, -780 and -779 are ascribable to the Kayatha Culture phase thus dating the Kayatha Culture from c. 2000 to 1800 B.C. The Banas culture at Kayatha is dated by TF-776, -777, -399 and -678, thus placing it between c. 1800 - 1600 B.C. The Malwa culture of the site is datable to c. 1600 - 1300 B.C. as indicated by TF -974, -398, -397, -402 and -676.

The Chalcolithic site of Navadatoli has four phases in Pd-III; phases I to III belong to the Malwa Culture; phase IV has the Jorwe Culture. The Malwa Culture at this site is dated by seven ^{14}C dates to c. 1700-1450 B.C. Eran is another site in M.P. but in the absence of a detailed report it is difficult to evaluate the ^{14}C dates. The Chalcolithic phase here can be dated from c. 1500 to 1000 B.C.

In Maharashtra Inamgaon is another famous chalcolithic site near Pune. About a score of ^{14}C dated are available from this site. The Malwa Culture here can be dated between c. 1600-1400 B.C. The Jorwe Culture succeeds the Malwa Culture without any break and continues upto the first millennium B.C.

The Jorwe Culture was quite well spread in Maharashtra. Nevasa, Chandoli, Sonegaon, Khed etc are exclusively Jorwe culture sites. With more ^{14}C dates available now, one can date the Jorwe Culture between c. 1400 to 900 B.C. In fact, it appears at Inamgaon, that the late Jorwe Culture might have gradually merged with the early Iron Age Culture.

The Chalcolithic culture of Bengal is marked by painted BRW and also black-on-red wares. Mahishdal, Bharatpur and Pandu Rajar Dhibhi are the main sites which are covered by a time bracket of c. 1500-800 B.C. Sohgaura in eastern U.P. is also marked by a painted BRW. PRL-178 and -179 place it at c. 1300 B.C.

Prabhas Patan in Western India has yielded a distinctive culture with the evidence of a market place like structure. From the flood deposit it has given ^{14}C dated of c. 2400 B.C. If one includes this date, the time- spread for this culture becomes c. 2400-1500 B.C. If we exclude the flood levels, a more precise date bracket, should be c. 2100-1500 B.C. Malvan, on the western coast has affinities with the late Harappan Culture of Rangpur Pd IIIC. We have only one date TF -1084, -800 + 95 B.C. for Malvan.

Koldihwa U.P. and Barkhera in M.P. have given some dates which go back to IV-V Millennia B.C. Whether these were neolithic-chalcolithic or mesolithic culture can be resolved only after further work.

Iron Age Cultures (*Tables 3 & 4*)

All the Chalcolithic cultures excepting the Harappan were village cultures with an economy similar to the neolithic cultures. With copper technology only the semi-arid alluvial plains of the Indus could become urbanised. But with the availability of iron even monsoonal forests of U.P. and Bihar were cleared and the plains colonized. This led to the second urbanisation in India, this time in the Gangetic valley. In the north the Painted Grey Ware (PGW) and the Northern Black Polished Ware (NBPW) were the early Iron Age cultures. At some sites a pre-PGW, Black-and-Red Ware (BRW) culture is said to mark the beginning of the Iron Age in the north. The Iron Age in the south is marked by the Megalithic culture. The ^{14}C dated PGW sites are : Allahapur, Atranjikhera,

Bateswar, Hastinapur, Khalaua, Mathura—all in U.P.—and Noh and Jodhpura, in Rajasthan (*Table 3*). All the eighteen ^{14}C dates for PGW fall within a bracket of c. 800–300 B.C., except TF-191, 1025 ± 110 . It should, however, be noted that in most of western U.P. and Rajasthan sites there is overlap and continuity between the PGW and the NBPW traditions. In fact, at Mathura the early NBPW is associated with the PGW and a grey ware and we have some dates (PRL-336, —334, —333) which are earliest so far for any NBPW sites.

Except for Mathura, the NBPW sites are almost covered by a bracket of c. 600—50 B.C. The NBPW had a wider distribution from Charsada near Peshawar to Bihar, extending down into M.P. and A.P.

There are very few ^{14}C dates from the early levels of the Iron Age in south India (*Table 14*) ; only Hallur gives two ^{14}C dates for neolithic—BRW transition phase. Megaliths have provided very scarce material for ^{14}C dating. Halingalli (Karnataka) and Tograpalli (Tamil Nadn) megaliths have given three ^{14}C dates—but none of them is older than 300 B.C. Paiyampalli has given TF—828, 210 ± 100 B.C. and TF—823, 640 ± 105 B.C. dates. Takalghat (Vidarbha, Maharashtra) megaliths have been dated to c. 600 B.C. (TF—783, 615 ± 105 and TF—784, 555 ± 100).

Conclusions

One can summarise the approximate chronologies of different cultures as follows :

Harappa Culture	—C. 2300—2000 B.C. (Nuclear Region)
Prabhas Culture	—C. 2200—1700 B.C. (Peripheral Region)
Banas Culture	—C. 2400—1500 B.C. (maximum)
Kayatha Culture	—C. 2000—1400 B.C.
Malwa Culture	—C. 2000—1800 B.C.
Jorwe Culture	—C. 1700—1400 B.C.
Jodhpura Culture	—C. 1400—900 B.C.
PGW Culture	—C. 2500—2000 B.C.
NBP Culture	—C. 800—300 B.C.
Southern Megaliths	—C. 600—50 B.C.
	—C. 600—100 B.C.

A chronological perspective of archaeological cultures brings forth many interesting features. For example, at c. 2000 B.C., we had the Harappa Culture in the Indus basin ; neolithic cultures in Kashmir and the south ; and Chalcolithic cultures in eastern Rajasthan, central India and the Deccan. This clearly shows an uneven socio-economic development in the different regions of the country. One also finds some ecological correlation of archaeological cultures. The Indus basin (including R. Ghaggar) was occupied by the Harappa Culture. The Gangetic valley comes into focus only in the first millennium B.C. The central and Deccan plateaus were the home of the Chalcolithic cultures. The neolithic cultures of the south thrived on the granite terraced hilis and of Kashmir on the Upper Karewas.

One should also note that the Chalcolithic cultures, including the Harappan, are older in the west and northwest of the subcontinent but as one moves towards the east

they are younger in age. In general, from the Stone Age to the Iron Age, Indian cultures start later than their West Asian counterparts. So also the advent of copper technology in India is about a thousand years younger and that of the iron a few hundred Years later than West Asia. Whether Indian technologies were developed independently or were borrowed, their dates are certainly later than West Asia. Still there are significant lacunae in the chronology. In the near future, Thermoluminescent dating may also help us to fill some of these gaps.

Acknowledgements

We thank Shri R.V. Krishnamurthy and Dr. R.K. Pant for help in ^{14}C dating.

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Table : 1

¹⁴C Dates of Harappan and Pre-Harappan Sites

<i>Sites (State)</i>	<i>Cultural Association</i>	<i>¹⁴C dates in years B.C. based on half life = 5730 Years</i>	
1	2	3	
Amri (W. Pakistan)	Pre-Harappan	TF — 863, TF — 864, UCLA—1923A, UCLA—1923B,	2665±110 2900±115 3406±137 3334± 77
Balakot (W. Pakistan)	Pre-Harappan	UCLA—1923C, UCLA—1924D, PRL — 204,	3061± 82 2346± 82 1400±130
Banawali (Haryana)	Harappan	PRL — 203, PRL — 205, PRL — 207,	1960±160 1980±190 1240±110
Bara (Punjab)	Harappan (?)	TF — 1204, TF — 1205, TF — 1207,	1845±155 1890± 95 1645± 90
Damb Sadaat	Pre-Harappan	UW — 60, P — 523, L — 180E,	2200±165 2200± 75 2200±360
Ghalighai (W. Pakistan)	Harappan	L — 180C, P — 522, L — 180B,	2220±410 2550±200 2320±360
Gumla (W. Pakistan)	Pre-Harappan	UW — 59,	2510± 70
Hathala (W. Pakistan)	Pre-Harappan	R — 378a,	1923± 55
Kalibangan Pd I (Rajasthan)	Pre-Harappan	TF — 154, TF — 156, TF — 165, TF — 161, TF — 240, TF — 162, TF — 241, TF — 157, TF — 155, TF — 143, TF — 946, TF — 149,	1820±115 1900±110 1965±105 2095±105 1765±115 2105±105 2255± 95 2290±120 2370±120 1665±110 1765±105 1830±145

1	2	3
Kalibangan Pd II (Rajasthan)	Harappan	TF — 150, 1900±105
		TF — 605, 1975±110
		P — 481, 2050± 75
		TF — 153, 2075±110
		TF — 25, 2090±115
		TF — 942, 2225±115
		TF — 152, 1770± 90
		TF — 142, 1790±105
		TF — 141, 1860±115
		TF — 139, 1930±105
Kalibangan Pd II (continued)		TF — 151, 1960±105
		TF — 958, 1980±100
		TF — 147, 2030±105
		TF — 145, 2060±105
		TF — 608, 2075±110
		TF — 947, 1925± 90
		TF — 163, 2080±105
		TF — 607, 2090±125
		TF — 160, 2230±105
		P — 195, 2100±140
Kot Diji Pd I (W. Pakistan)	Pre-Harappan	P — 180, 2250±140
		P — 179, 2330±155
		P — 196, 2600±145
		TF — 19, 1800±140
		TF — 23, 1865±110
		TF — 29, 1895±115
Lothal (Gujarat)	Harappan	TF — 26, 2000±125
		TF — 27, 2000±115
		TF — 22, 2010±115
		TF — 133, 1895±115
		TF — 136, 2080±135
		PRL — 290, 1980±140
Mitathal (Haryana)	Harappan (?)	PRL — 292, 2380±220
		PRL — 291, 1760±110
		TF — 75, 1755±115
		P — 1182A, 1865± 65
		P — 1176, 1965± 60
		P — 1178A, 1965± 60
Mohenjodaro (W. Pakistan)	Harappan	P — 1180, 1995± 65
		P — 1189, 2085± 65
		P — 1177, 2155± 65
		TF — 1129, 3145±110
		P — 1178A, 1965± 60
		P — 1180, 1995± 65
Mundigak (Afghanistan)	Pre-Harappan	P — 1189, 2085± 65
		TF — 1132, 2995±105
		TF — 1131, 2755±105

1	2		3
Niaibuthi (W. Pakistan)	Pre-Harappan	P — 478,	1900± 65
Nindovari Dam (W. Pakistan)	Pre-Harappan	TF — 862,	2065±110
Rojdi (Gujarat)	Harappan	TF — 199, TF — 200, TF —1309, & —1304,	1745±105 1270±115
Surkotada (Gujarat)	Harappan	TF —1301, TF —1305, PRL — 85, TF —1310, TF —1295, TF —1297, TF —1294, TF —1307, TF —1311,	2000±135 2055±100 2315±135 1910±100 1940±100 1790± 95 1780±100 1660±110 1780± 90

Table : 2

¹⁴C Dates of Chalcolithic Sites (OCP=Ochre Coloured Pottery ; BRW=Black & Red Ware)

Sites (State)	Cultural Association	¹⁴ C dates in Years B.C. based on half-life=5730 Years		
		1	2	3
Ahar (Rajasthan)	Banas	TF —31,	1721±100	
		TF —32,	1550±110	
		TF —34,	1725±140	
		TF —37,	1305±115	
		V —56,	1875±100	
		V —55,	1990±125	
		V —54,	2000±100	
		V —58,	2055±105	
Bagor (Rajasthan)	Bagor	V —57,	2145±100	
		TF —1005,	2110±90	
Barkhera (M.P.)	Malwa	& —1006,		
Bharatpur	Eastern Chalcolithic	TF —1009,	2765±105	
(West Bengal)	Chalcolithic	PRL —111,	1315±110	
		PRL —15,	1435±140	
		PRL —188A,	900±150	
		PRL —187,	1180±150	
		TF —43,	1040±105	
		TF —42,	1170±120	
		P —474,	1240±190	
		P —472,	1300± 70	
Chandoli (Maharashtra)	Jorwe	P —473,	1300± 70	
		TF —444,	715±105	
Chirand (Bihar)	Chalcolithic	TF —334,	845±125	
		TF —1029,	1050± 90	
		TF —326,	1040±110	
		TF —324,	1270±110	
		P —525,	1340± 70	
		P —528,	1050± 65	
		P —526,	1280± 70	
		TF —330,	1365±100	
Eran (M.P.)	Chalcolithic	TF —327,	1425±105	
		TF —329,	1445±110	
		TF —331,	1500± 95	
		TF —1085,	1440±110	
		TF —1086,	1535±155	

1	2	3
Inamgaon (Maharashtra)	Chalcolithic	TF—1001, 1565± 95 PRL— 77, 1450±115 PRL— 59, 1350±110 PRL—133, 1370±110 TF— 923, 1025±170 TF— 996, 1070±185 TF— 922, 1345±100 TF— 924, 1370±200 TF—1087, 1405±105 TF—1000, 1375± 85 PRL— 93, 1160±105 PRL— 94, 1155±120 PRL— 57, 1190±110 TF—1330, 1225±105 TF—1235, 1275±95 PRL— 78, 870±115 PRL— 76, ±110 PRL—278, 1355±180 2230
Jodhpura (Rajasthan)	OCP	PRL—275, 2530±160 TF— 776, 1605±115 TF— 974, 1635±100 TF— 778, 1705± 95 TF— 777, 1780±100 TF— 780, 1835±100 TF— 779, 1840±110 TF— 781, 1880±105 TF— 679, 1300±135
Kayatha (M.P.)	Chalcolithic	TF—676, 1305±105 TF—401, 1335±105 TF—402, 1380±100 TF—405, 1465±100 TF—397, 1500±100 TF—398, 1675±100 TF—678, 1685±100 TF—399, 1675±100 TF—396, 1730±100 TF—680, 2015±110 PRL—220, 1030±160
Khed (Maharashtra)	Jorwe Culture	PRL—221, 1180± 90
Koldihawa (U.P.)	Chalcolithic	PRL—223, 1440±120
Mahisdal		TF—390, 855±100

1	2	3	
(West Bengal)	BRW	TF —391, TF —392, TF —1084, P —205, TF — 59, P —204, P —200, P —475, P —201, P —202, P —476, TF — 40,	1380±105 1085±110 800± 95 1445±130 1525±110 1600±130 1610±130 1610± 70 1645±130 1660±130 2300± 70 1250±110
✓ Malvan (Gujarat)	Late Harappan		
Navadatoli (M.P.)	Malva		
Nevasa (Maharashtra)	Jorwe	P —181,	
Pandu Rajar	Eastern	1250±125	
Dhibi	Chalcolithic	?	
(West Bengal)		1012±120	
✓ Prabhas Patan	Prabhas	TF —1287, PRL— 90, TF —1284, TF —1286, PRL— 92, PRL— 91, PRL— 20,	
Sohgaura (U.P.)	BRW (painted)	2455±110 2410±115 1615±100 1755± 95 1990±100 2020±170 1485±110 1330±110 1230±110 1290± 95 1330±100	
Sonegaon (Maharashtra)	Jorwe Culture	TF —379, TF —383, TF —382, TF —380, TF —384,	
		1340±100 1375±110 1565±100	

Table : 3

¹⁴C Dates of Iron Age Sites of North India

(PGW=Painted Grey Ware ;
 NBPW=Northern Black Polished Ware ;
 BRW=Black and Red Ware).

Sites (State.)	Cultural Association	¹⁴ C dates in years B.C. based on half-life—5730 years.		
		1	2	3
Ahichchatra (U.P.)	NBPW		TF —310, TF —311,	160± 95 475±105
Allahpur (U.P.)	PGW		PRL — 81, PRL — 83,	385± 95 275±110
Atranjikhera (U.P.)	PGW & NBPW			
	PGW		TF —191,	1025±110
	PGW		TF —221,	535±100
	NBPW		TF —832,	260±105
	NBPW		TF —284,	295±100
	NBPW		TF —194,	530± 85
	BRW		TF —289,	675±110
	BRW		TF —415,	570±210
Bateswar (U.P.)	PGW		PRL— 198,	620± 90
Besnagar (M.P.)	NBPW		TF —254, TF —387, PRL —283,	295±110 470±105 310±140
Charsada (W. Pakistan)	NBPW		UW — 78, UW — 77,	50± 70 270± 60
Chirand (Bihar)	NBPW		TF —446,	35±105
Hastinapur (U.P.)	PGW		TF — 83, TF —112, TF — 90, TF — 85, TF — 91,	335±115 375±100 390±115 505±130 570±125
	NBPW		TF — 80, and TF — 82, TF — 81, TF — 88,	50±115 125±100 340±115
Hetimpur (U.P.)	NBPW		TF —177,	80±105 (A.D.)
Jodhpura (Rajasthan)	PGW		TF —176, PRL —213.	105±105 320±110

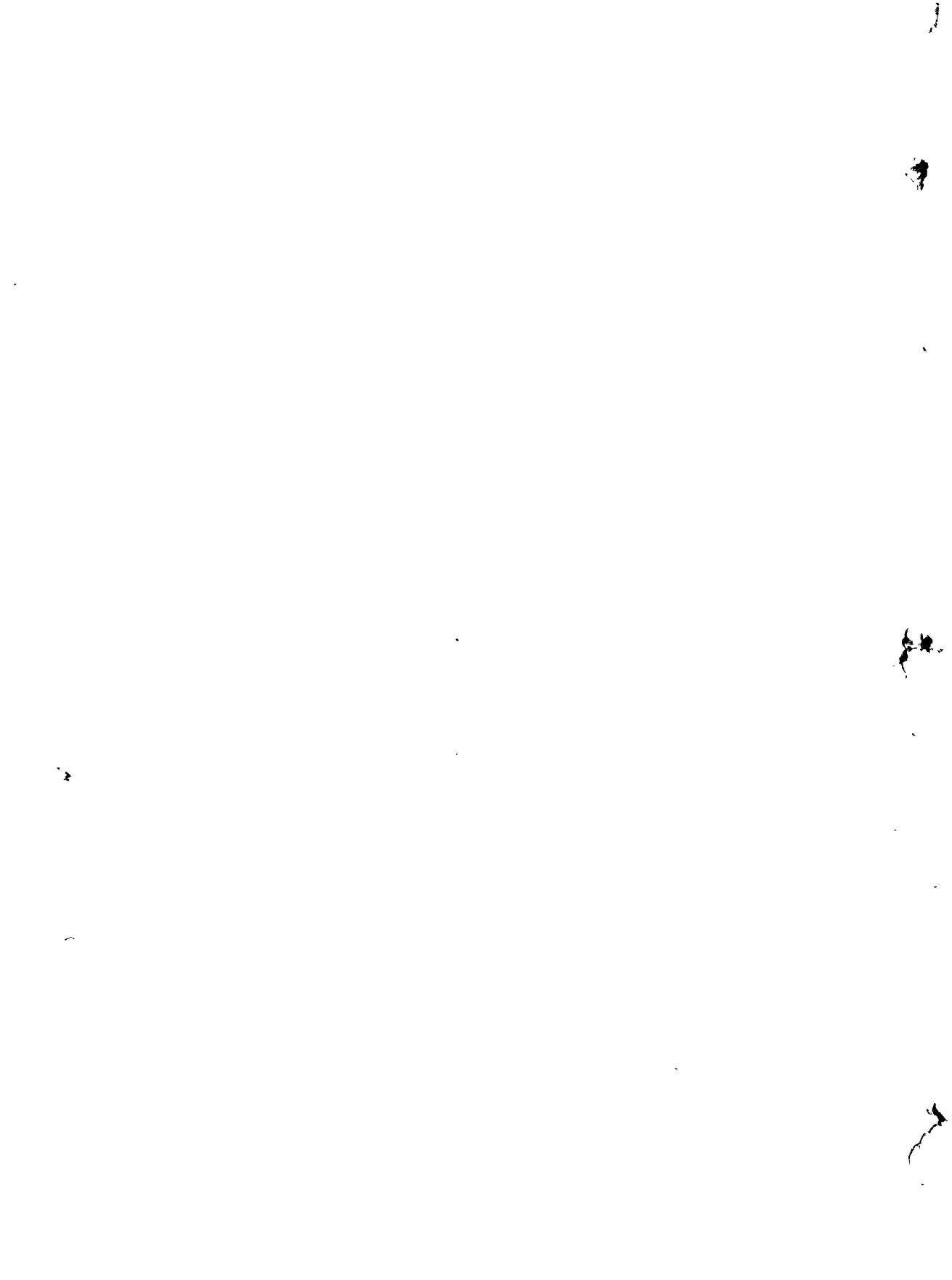
1	2	3	
Kausambi (U.P.)	NBPW	PRL — 273, PRL — 272, PRL — 274, TF — 226,	420±150 800±150 370±110 220±100
Kayatha (M.P.)	NBPW	TF — 104, TF — 100, TF — 105, TF — 225, TF — 103, TF — 219, TF — 221,	270±110 275±100 335±115 400±110 410±110 440±100 500±105
Khalaua (U.P.)	PGW	TF — 394,	495±100
Kotia (U.P.)	Megalithic	TF — 674, PRL — 67,	470±100 570±160
Mahisdal (W. Bengal)	BRW	PRL — 68, TF — 1228,	485±170 535± 95
Mathura (U.P.)	NBPW	TF — 319,	270±105
Noh (Rajasthan)	PGW	TF — 389, PRL — 336,	690±105 660±100
Purana Qila (Delhi)	NBPW	PRL — 334, PRL — 333, PRL — 340, PRL — 342, PRL — 338, PRL — 343, PRL — 337,	730±150 610±150 510±160 300±160 400±110 270±100 460±100
Rajghat (U.P.)	NBPW	PRL — 339, TF — 1144,	500±100 490± 90
		UCLA— 703A, TF — 993, UCLA— 703B, TF — 994,	605±260 725±150 820±225 685±105
	NBPW	PRL — 97,	105±145
	BRW	TF — 293, TF — 294,	490±110 305± 94

1	2		3
Ragir (Bihar)	NBPW	TF — 46,	260±100
Ropar (Punjab)	NBPW	TF — 45, TF — 213,	265±105 390±105
Sohgaura (U.P.)	NBPW	TF — 209, PRL — 183,	405 485±100 590±110
Sonpur (Bihar)	BRW	PRL — 182A, PRL — 182B, TF — 376,	240± 90 410±150 635±110
Takiaper (D.P.)	NBPW	PRL — 184,	180±110
Ujjain (M.P.)	NBPW	TF — 409,	450± 95



SIX

EPILOGUE



Archaeology in India

A Professional Assessment

D.P. Agrawal & Dilip K. Chakrabarti

THE FOREGOING essays give a broad review of Indian protohistoric archaeology. They also underline in many cases the limitations of Indian archaeology. The purpose of this epilogue is to emphasise these limitations and the historical factors behind them.

General Limitations of Indian Archaeological Research

Any archaeological research that involves field-work goes through all or most of the following stages : (1) choice of the problem and field-area, (2) exploratory survey, (3) excavation and the associated technical problems of retrieval and storage of data, (4) analytical work, (5) historical interpretation, and finally, (5) publication. It may be worthwhile to assess how these stages are gone through in Indian archeology.

Choice of the problem : After the phase of initial discoveries was over by 1850s, there has always been some concern with problems in Indian archaeological research. It is not quite correct to say that Indian archaeology became problem-oriented only during the Director-Generalship (of the Archaeological Survey of India) of the late Sir Mortimer Wheeler. For instance, the major idea behind Alexander Cunningham's field-work in 1860s and 1870s was the archaeological elucidation of historical geography. John Marshall was interested in Buddhist India, and there is no doubt that the image of that period is to a great extent conditioned by Marshall's and his colleagues' work at famous Buddhist sites like Sanchi, Rajagriha, Sravasti, etc. What Mortimer Wheeler basically did was to reorient the concept of Indian archaeological planning by focussing on the building up of a reliable sequence and a reliable chronology. That this preoccupation has been effective is amply demonstrated by the discovery of many new cultural sequences and the opening up of a new chronological perspective.

However, Indian archaeology has been immersed too long in the problems of sequence and chronology. In some cases it has also been concerned with horizontal excavations. But it has never pursued any specific cultural issue, and in this it has failed to adapt itself to the changing concepts of archaeological research. One may perhaps elaborate this point by referring to the beginning of modern studies on the transition to, and the beginning of, food-production. In the early fifties R.J. Braidwood took up this

issue as the major objective of his field-investigations. The first major publication of this project, *Prehistoric Investigations in Iraqi Kurdistan (Chicago, 1956)* is a milestone in this kind of research, and its influence is apparent in the spate of recent publications in the field. There has been no field-investigation in India with any such wide cultural issue in mind.

Exploratory survey : Notwithstanding the discovery of a large number of sites every year, the full potential of the exploratory survey is not properly appreciated in Indian archaeology. First, there is a tendency to look for specific category of sites in each exploration whereas attention should be paid to all categories of sites in the explored area. Secondly, the locational details of explored settlements are by and large ignored when they are reported. One seldom comes across any significant body of data on the exact geographical co-ordinates of a settlement and their position in relation to soil, water, trade-route and other micro-geographical features. The theoretical importance of these data is enormous. By simply studying the occupational pattern of an area in depth it is possible to understand the man-land relationship in that particular area with insight into such issues as demography, functional relationship between settlements, crop-pattern, agricultural techniques, changes in micro-geographical features, etc. Analyses of this kind are a crying need in Indian archaeology.

Excavation and the retrieval of data : Excavations are, by and large, done with care and precision in the Indian context, but this need not be a source of undue complacency as it very often is. It may be somewhat curious but is nonetheless true that the excavators often neglect the total context of their sites. Settlements have some problems as settlements and unless these problems are tackled in the field in a planned fashion the net result of the excavation may simply be the recovery of artifacts and structural details. Secondly, the process of retrieval of data in Indian excavations is in many cases partial and incomplete. The total or a reasonably adequate retrieval of data is necessary for a number of reasons: detailed, technical analyses of sherds, organic remains and other varieties of artifacts. Thirdly, the storage of excavated data in such ways as to facilitate future studies by researchers other than the excavators may be considered an important necessity if Indian archaeology believes in generating a critical spirit. Most of the Indian institutions tend to ignore this issue.

Technical analyses : Very little has been done in this field in the Indian context except the individual efforts of some scholars. The natural scientists do not provide any magic answer to archaeological or historical problems. The problems will have to be posed first by the archaeologists and only then a meaningful dialogue can be established between them and the natural scientists. The possibilities of this dialogue are enormous. No significant breakthrough in this line of work is possible in India unless its pressing urgency is realized by Indian academic agencies with interest in ancient Indian history and archaeology. There is also a general tendency to avoid the rigours of detailed technical analyses of artifacts in Indian archaeology. Even elementary statistical informations are very often missing in Indian excavation reports.

Interpretation : There is no great sense in the frequently mentioned dichotomy between archaeologists with a historical training and those with anthropological background. There is a difference of approach between these two groups but the basic aim remains the same : a coherent and better understanding of human past. No technique or concept, be it historical, anthropological or mathematical-statistical, can be ignored

as long as that leads toward a better realization of this aim. Some scholars will naturally feel more at home in some concepts than others, but that need not be an issue of debate in archaeology. If the theoretical structure of Indian archaeology is not what it should be that is not because Indian archaeologists are not anthropologists but because they have shown themselves by and large to be bad historians. It is not generally realized that the ideas of cultural change in terms of migration and diffusion of people, as one observes in Indian archaeology, are derived from a fragmentary approach to history, which still characterizes much of the Indian historical scene. For instance, what passes as socio-economic history in the context of ancient India is very often a mere tabulation of different types of data without any attempt to integrate them within a theoretical framework. If Indian archaeologists are all too eager to attach ethnic or linguistic labels to their prehistoric assemblages that is only because linguistic and ethnic groups happen to be the stock-in-trade of Indian ancient historical studies.

If Indian archaeology has to develop beyond its present intellectual structure it has to concern itself with total history. Colin Renfrew in his inaugural lecture at Southampton spoke of a "social archaeology" It is this social archaeology which is primarily needed in the Indian context.

Publication : No comment is necessary on this point because the Indian excavators' general unwillingness (of course, there are several notable exceptions) to share their finds with their colleagues through suitable publications is gradually leading to a situation which, unless reversed, will make archaeological research in the country a completely futile exercise.

Historical Reasons of the Present Situation in Indian Archaeology

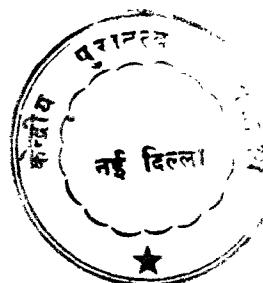
The present situation in Indian archaeology has its roots in several historical factors. Many of these are known to Indian archaeologists, particularly those of the younger generation, but they need spelling out in detailed and clear terms. Unless the Indian archaeologists are made clearly aware of these factors it is doubtful if they can outgrow them.

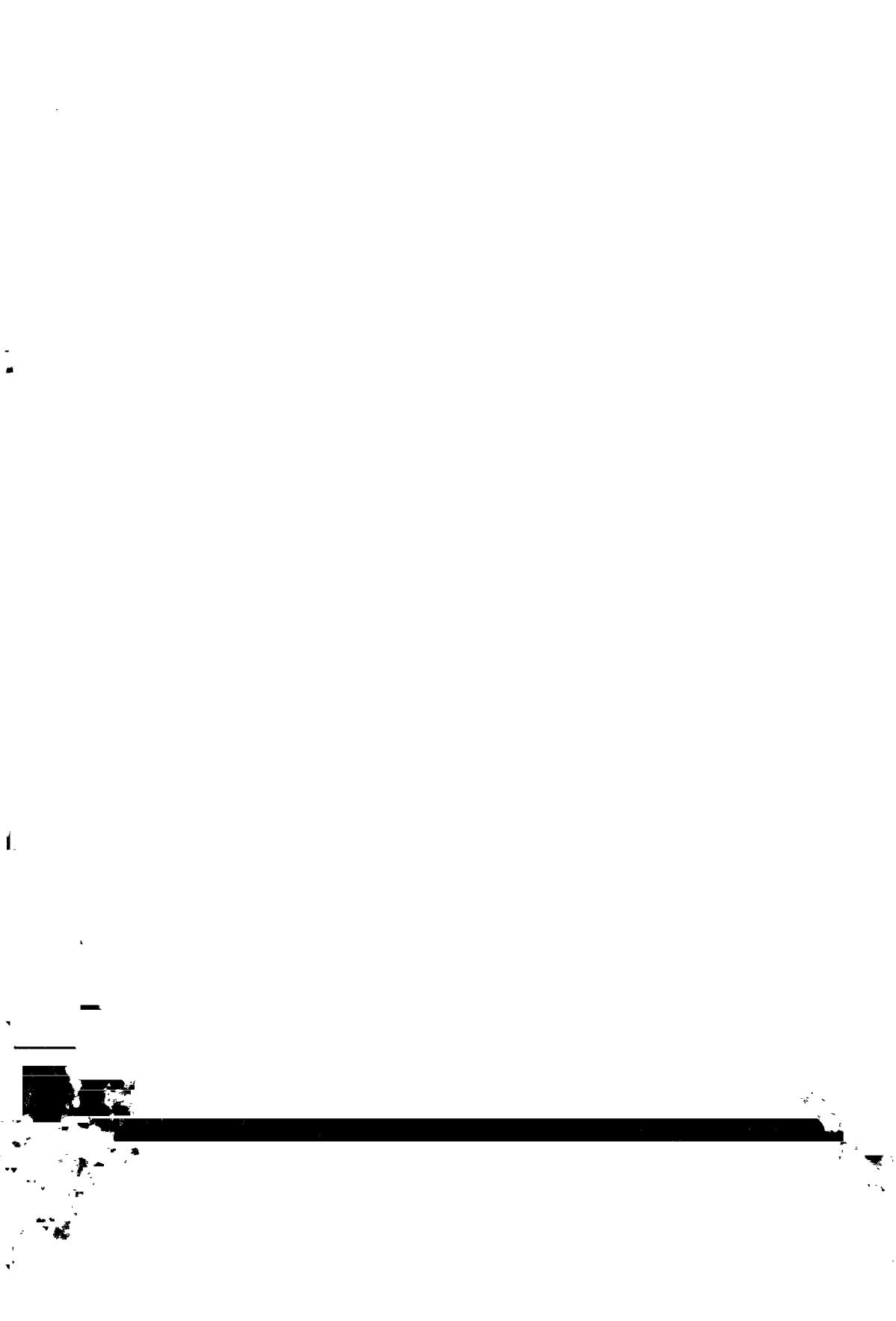
- (1) The historical syllabi of our universities, of which archaeology is a part, hardly put any emphasis on archaeology except on the specialized M. A. level without trying to create any earlier background in the subject. Even on this level archaeology is very often a part of ancient Indian historical studies where archaeology is usually treated as a set of mere field- techniques. Theoretical orientation hardly plays any role.
- (2) Due to the dominance of non-Indian and modern Indian history in our general historical education (where a knowledge of Tudor constitution based on tertiary sources is considered more relevant than a first-hand knowledge of Asokan inscriptions) not many of our bright students opt for ancient Indian history or archaeology. The scheme of historical education in India is essentially neo-colonial.
- (3) The nature of historical investigation and training in this country is such that this does not encourage students to undertake intensive field-investigations or appreciate the value of detailed microhistory.
- (4) The importance of natural-scientific techniques in, and a general multidisciplinary approach to, the study of ancient history is by and large not understood in the Indian context, and one would even say that the research structure of History or Ancient

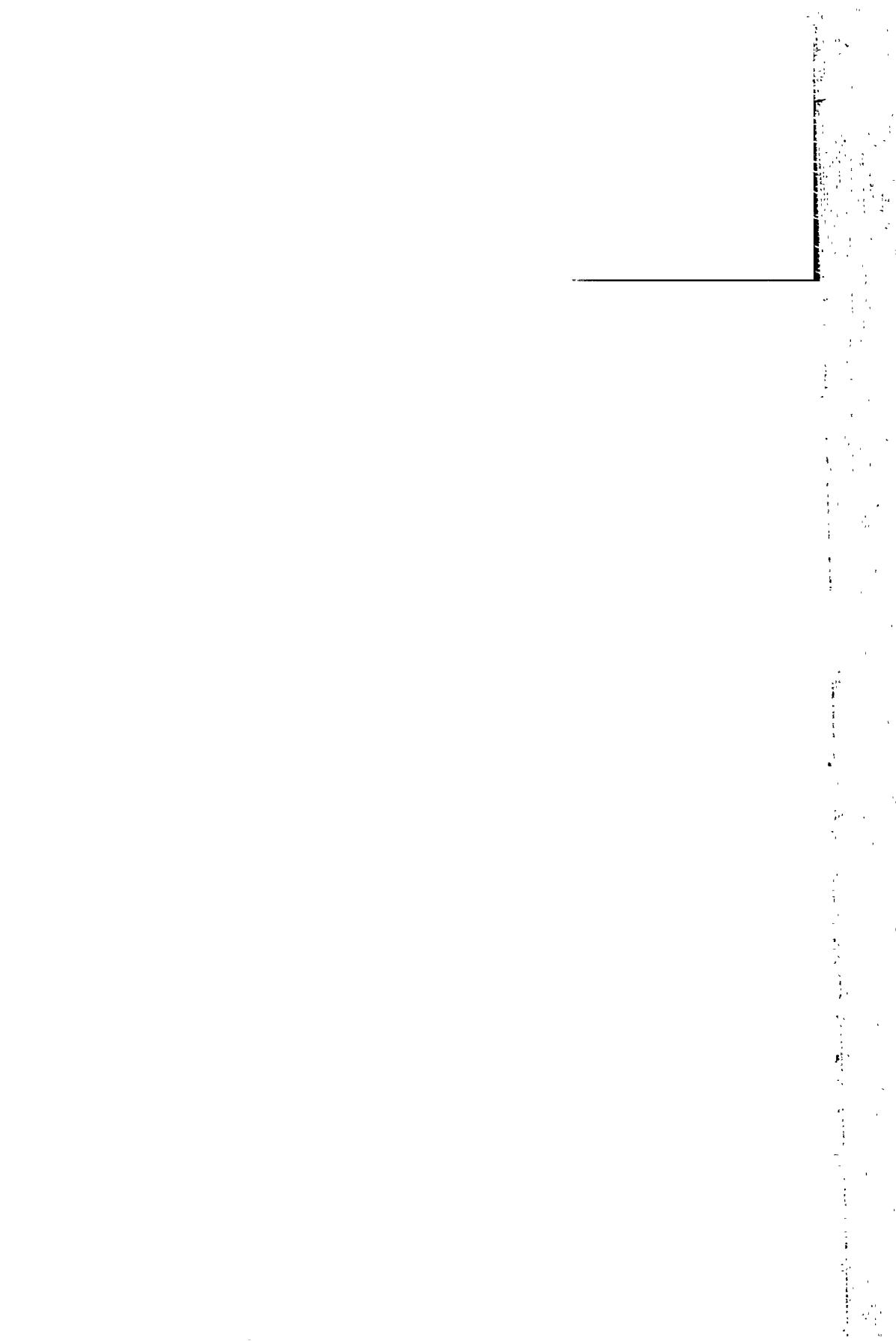
Indian History and Archaeology departments of our universities does not generally encourage this method and approach.

- (5) One should also emphasize the nature of leadership in Archaeology in our universities. Although archaeological field-research in Indian universities began in the forties, it was not taken up seriously till the fifties and early sixties. The leadership came from people who had been specializing in the usual branches of ancient Indian history but who found themselves in the role of archaeologists after a training in the field-methods of archaeology. They did not have any theoretical orientation in the subject. Besides, the notion of History carried by them was essentially that of 'orthodox' history i.e. a type of history in which dynastic problems were considered more important than others. Even in the field of economic, social and cultural history the emphasis was primarily on mere narration of data without much pre-occupation with their structural pattern or with quests for new types of data on such micro-features as settlements, changes in the drainage system, pattern of land-utilization, etc. In this context the editors of the present volume would like to put on record that the only person of this generation of Indian archaeologists who showed a total commitment to the subject is H. D. Sankalia of the Deccan College, Poona. This generation continues to dominate Indian archaeological studies even today.
- (6) Mainly because of this leadership, archaeology has always been viewed as a mere auxiliary to history, and not as an independent historical discipline by its own right with its own approach and techniques (both field-techniques and interpretative techniques) for historical investigations.
- (7) Just because archaeology is considered a mere auxiliary historical technique, it is seldom taken up in the Indian context in the proper spirit of research where proper collection of data, rigorous analyses and interpretation and publication are considered all-important.
- (8) Finally, what should be realized by historians of all categories is that a true history of the people of India, particularly ancient India, cannot be attempted only with the help of traditional data because of the inherent limitations of these data themselves. Most of our literary data are non-secular, chronologically and geographically ill-defined and reflect the world-view of the contemporary literate and ruling groups, and thus are hardly suitable for the writing of any material history of the people. On the basis of traditional data and approach it is impossible to attempt any grass-roots history of ancient India. New archaeological concepts and techniques provide the only answer for this. This is a point which is hardly realized by our ancient historians and even archaeologists themselves.

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